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DEPARTMENT OF
NORTHERN AFFAIRS
AND
NATIONAL RESOURCES

Annual Report

FISCAL YEAR 1956-1957

... and a special article:

"Canada's Heritage - The National Parks of Canada"

Canada, Dept. of Northern Affairs and
National Resources



Government
Publications

**Department of
Northern Affairs and
National Resources**

ANNUAL REPORT
FISCAL YEAR 1956-1957

**Including an article
Wisdom's Heritage – The National
Parks of Canada**

PRICE 50 CENTS



Department of
Northern Affairs and
National Development

ANNUAL REPORT
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*To His Excellency the Right Honourable Vincent Massey, C.H.,
Governor General and Commander-in-Chief of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the Annual Report of the Department of Northern Affairs and National Resources for the fiscal year ended March 31, 1957.

Respectfully submitted,

ALVIN HAMILTON,
*Minister of Northern Affairs and
National Resources*

OTTAWA, August 20, 1957.

*The Honourable Alvin Hamilton,
Minister of Northern Affairs and National Resources,
Ottawa.*

SIR:

I have the honour to submit the Fourth Annual Report of the Department of Northern Affairs and National Resources which covers the fiscal year ended March 31, 1957.

The year under review has been a period of continued growth and development for the Department. This is reflected in the fact that expenditures rose to nearly \$37 million—an increase of more than \$12 million over the previous year. This increase is accounted for in large measure by major capital construction programs in two areas of departmental activity—highway reconstruction in the national parks and the building of schools in the far north. Of course, in every branch improved salaries and increased costs for materials and services resulted in higher expenditures.

The improvement of highways in the national parks is a long-term program that will involve the spending of some \$60 million over an eight-year period. During the year substantial progress was made in this project with extensive work undertaken in the Cape Breton Island, Banff, Yoho, and Kootenay Parks.

Visitors to the national parks passed the 3½ million mark—an increase of some 6 per cent over the previous year. Altogether, apart from the highway construction program, a determined effort was made to improve tourist facilities, such as trailer camps and camp-grounds, in order that the record numbers of visitors might receive maximum enjoyment from the parks. It is gratifying to report that forest fire losses in the parks were down, and the fact that lightning was the greatest single cause of fire reflects the growing care which visitors are taking in this connection. May I respectfully draw your attention to the special article, "Wisdom's Heritage—the National Parks of Canada," which appears as a preface to this Report.

In the department's activities related to the development of the far north, considerable progress was made with the new school program which has now entered the construction stage. Like highway construction in the parks, this is a long-term program under which a number of schools will be built as well as residence facilities for children who come from distant points. This major construction program is expected to help in bringing the level of educational services in the north more closely in line with those in other parts of the country.

Transportation is widely recognized as the key to the future economic growth of the north, and during the year under review the construction and maintenance of the highways in the Yukon and Northwest Territories continued. In addition, the linking of Yellowknife with the outside by an extension of the Mackenzie Highway was brought closer to realization.

The discovery and development of mineral and other resources received increased attention. By year's end, the first mine in Canada to operate north of the tree-line was near to going into production, a nickel mine in the Rankin Inlet area. Notable in the intense search for base metals in the northern parts of the Territories was the beginning of a three and a half million dollar program of copper exploration in the Coppermine River and Dismal Lakes areas and the extension of iron ore exploration to Baffin Island and the islands along the east coasts of Hudson Bay. Staking of mineral claims was somewhat lighter than the year before, with about eleven thousand—chiefly of copper-nickel, iron, and silver-lead-zinc prospects. The value of gold production exceeded 1955-56, and interest in oil and gas remained high.

To provide guidance to Eskimos newly engaged in paid employment and in areas not yet affected by the impact of industrial activity, eight Northern Service Officers and a social worker were posted to communities scattered from Frobisher Bay in the east to Tuktoyaktuk at the mouth of the Mackenzie River in the west.

Canada's forest industries maintained a high level of activity during the year. Although there was a slight decrease in lumber production generally, pulp and paper attained record proportions. New agreements were entered into with participating provinces extending the time for the completion of initial forest inventories and providing assistance for their maintenance over a period of five years. Initial inventories were completed in four of the eight participating provinces, and about 90 per cent of the entire job had been done. Under the renewed reforestation agreements, nearly seven and a half million trees were planted. Spraying operations against the spruce budworm continued in New Brunswick, and forest products research was carried out in such fields as timber engineering, plywood and adhesives, wood preservation, timber pathology, wood chemistry, logging and milling, lumber seasoning, wood anatomy, and the utilization of wood residues. Substantial progress was made on new laboratory facilities in Ottawa, Vancouver, Montreal, and Petawawa.

The wise use of the nation's water resources continued to be an important concern of the Department. During the year, regular measurements of surface water were made at more than 1,100 gauging stations. In general, run-off conditions were close to normal. Once again there was an increase of nearly five per cent in hydro-electric installations across Canada.

In the Northwest Territories and in the national parks, the study of mammal problems included preparation for a joint federal-provincial research program on the caribou. The continuing drastic decline in the numbers of this animal is a source of very great concern, especially to the native people of the north. In co-operation with United States scientists, annual censuses of waterfowl populations were carried out. Studies were also made of other rare and threatened species.

Two branches were created within the National Museum—one to deal with natural history and the other with human history. Botany, zoology, and palæontology are to be the principal divisions of the Natural History Branch, and ethnology and archæology the chief interests of the Human History Branch. During the year both branches had parties in the field carrying out useful investigations.

As in previous years, the Canadian Government Travel Bureau undertook a vigorous tourist promotion program to attract visitors to this country. Its success is evident in the fact that tourist revenues were ahead of the record levels previously established. While border crossings into Canada showed a slight decline in 1956, long-stay automobile entries increased by more than 20 per cent. It is of interest to note that Canadian tourists spent less money in the United States than in previous years but were still spending considerably more than U.S. tourists visiting in Canada.

Mr. Minister, these are some of the highlights of our work during 1956-57. These and other developments relating to the Department's responsibilities are dealt with fully in this Report. I should not like, however, to conclude this letter of transmittal without acknowledging the loyalty and effectiveness of the Department's staff, without whose efforts the achievements here recorded would not have been possible.

Your obedient servant,

R. G. ROBERTSON,
Deputy Minister

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Inserted at the back of this Report is a map showing the location of national and historic parks; game reserves; highway projects; forestry, water resources, wildlife, engineering and Northern Administration offices and posts, and other centres of departmental activity.

Department of Northern Affairs and National Resources*

Minister	HON. JEAN LESAGE
Executive Assistant	G. A. CODERRE
Private Secretary	DENYS PARÉ
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Deputy Minister	R. G. ROBERTSON
Assistant Deputy Minister	C. W. JACKSON
Assistant Deputy Minister	E. A. CÔTÉ
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Advisory Committee on Water Use Policy	K. KRISTJANSON
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Economic Division	Chief—C. H. HERBERT
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Arctic Division	Chief—B. G. SIVERTZ
Education Division	Chief—J. V. JACOBSON
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Works and Services Division	Chief—J. I. NICOL
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National Historic Sites Division	Chief—A. J. H. RICHARDSON
Engineering Services Division	Chief—G. L. SCOTT
Canadian Wildlife Service	Chief—W. W. MAIR
Water Resources Branch	
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Operations Division	Chief Hydraulic Engineer— R. H. CLARK
Hydraulics Division	Chief—J. D. MCLEOD
Forestry Branch	
Director	J. D. B. HARRISON
Forest Research Division	Chief—To be appointed.
Forestry Operations Division	Chief—H. W. BEALL
Forest Products Laboratories Division	Chief—J. H. JENKINS
Natural History Branch of the National Museum of Canada	
Director	L. S. RUSSELL
Botany	A. E. PORSILD
Geology	J. F. HENDERSON (Hon. Curator)
Mineralogy	S. C. ROBINSON (Hon. Curator)
Palæontology (Vertebrate)	W. LANGSTON, Jr.
(Invertebrate)	H. W. FREBOLD (Hon. Curator)
Zoology	W. E. GODFREY (Acting)
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Archæology	R. S. MACNEISH
Anthropology	MARCEL RIOUX
Canadian Government Travel Bureau	
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Travel Counselling Section	R. D. PALMER
Publicity Section	L. B. CONNERY
Publications Section	J. G. PERDUE
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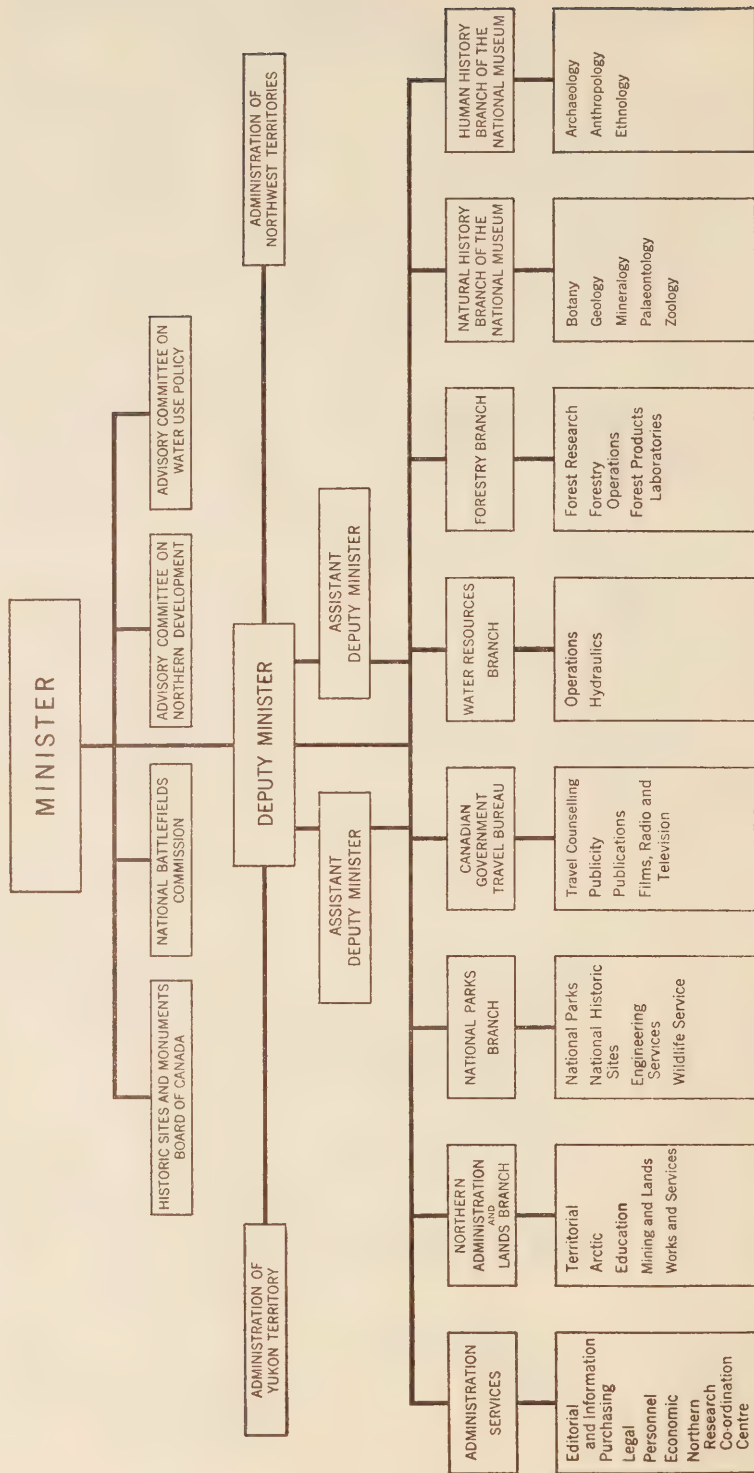
*List of officials as of March 31, 1957.

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Archæology	R. S. MACNEISH
Anthropology	MARCEL RIOUX
Canadian Government Travel Bureau	
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Travel Counselling Section	R. D. PALMER
Publicity Section	R. DEGROSBOIS
Publications Section	J. G. PERDUE
Films, Radio, and Television Section	H. S. ROBINSON

*List of officials as of September 1, 1957.

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES



Wisdom's Heritage—

The National Parks of Canada

—newspaper headlines—editorials—the comments of friends and neighbours—the “sun sinks slowly in the west” school of travel blurbs—the call of a loon on a lonely lake—discussions of “parks policy” in Parliament—a snow-crested mountain in solitary grandeur—a family picnicking at the roadside—problems of park townsite management—“a white tent pitched . . .”—the parks belong to the people—

—these random phrases all mean something—mean a great deal to every one of us in Canada—just how much, depends on what we know about one of our greatest heritages—the NATIONAL PARKS OF CANADA. What are the parks anyway? Why have them at all? Is there any real thought behind them? Or are they just places “to attract the tourists”?

There is indeed a thought behind the parks—in fact it might better be described as a philosophy. Basically the idea is simple—a national park is an area set aside for all time for the use of the people—an area of particular natural beauty that is characteristic of the finest scenery in the various parts of Canada—an area that is to be maintained forever as closely as possible to its unspoiled original state. As the National Parks Act proclaims—in far from the usual prosaic language of statutes —“the parks are hereby dedicated to the people of Canada for their benefit, education, and enjoyment—and shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations.”

This all sounds quite pleasant—anyone's first reaction might well be, “Why sure, we'll agree to that, lets have lots of parks!” It is easy to be in favour of something if the attractions of the alternatives are not too apparent. But it is a common experience to find that few things in life are worthwhile unless some effort and sacrifice are made in reaching for them. This unquestionably applies to this matter of parks.

Most land in Canada is blessed with great resources both hidden and apparent—land that can be used for farming—for lumbering—for mining

—for hydro-electric developments. It would probably be difficult to find any area in Canada that does not have or that will not have in future a high potential economic value in one way or another. This applies equally to the areas that are "scenic" as well as to those that are not. Establishing a national park means giving up for all time to come the possible economic advantages of exploiting the material resources of the area concerned and receiving in exchange nothing more than those intangible benefits that belong in the realm of the spirit instead of dollars and cents—here is the effort, here is the sacrifice! When Parliament creates national parks, it speaks for the soul of Canada, and not for its pocket-book.

In the growth of a country, the on-rush of settlement, great increases in population, and the advance of industry are almost certain to result in the destruction of much natural beauty and in the gradual elimination of wildlife. As settlement spreads, the economic value of each untouched area grows proportionately, and it becomes more and more costly and difficult to set aside areas in their natural state for the perpetual enjoyment of the people. At the same time, the denser the population becomes, the more the pace of living increases, the more essential it is to have available such areas in which everyone will have the opportunity to renew his understanding of the things of nature and to relax from the pressures of daily life in surroundings of quiet beauty.

In Canada we have been most fortunate that our forefathers saw not only the future growth of the country but the future needs of its people. Even in the early days, steps were taken to conserve park areas for the future benefits that are now enjoyed and that will be enjoyed by our children and their children after them.

The year 1957 marks the seventieth anniversary of the establishment of Canada's system of national parks. From a modest beginning of 260 square miles, the system has expanded until now there are eighteen parks with an area of more than 29,000 square miles.

The value of the parks to Canada can perhaps be demonstrated best by the growing numbers of visitors that come to enjoy them. Last year they were visited by over 3,500,000 people from all parts of Canada, the United States, and from many other countries around the world, and the total net cost of operating and developing the parks—including the cost of all new construction—was approximately \$13,000,000 or less than 80 cents for each person making up the population of Canada.

Our national park system had its beginning when the first trans-continental railway, the Canadian Pacific, was being pushed westward from the prairies into the Canadian Rockies. Workmen engaged in its construction discovered the hot mineral springs that are now among the great attractions of Banff Park in the Province of Alberta. In order to preserve the springs, the Government of the day chose to reserve them as a public possession, and in November, 1885, a small parcel of



land containing just ten square miles was set aside. So impressed were early travellers by the magnificent scenery in the area that the Government was urged to enlarge the original reservation, and in 1887 the Parliament of Canada established our first national park. It was called Rocky Mountain Park and contained 260 square miles. In supporting the Bill, the Prime Minister, the Right Honourable Sir John A. Macdonald, prophesied that the area would become a great public resort. His prophecy has been amply fulfilled. This original area has been enlarged almost ten times over during the intervening years and is known today as Banff National Park.

Other park areas were also set aside in the early years. Ten square miles in the vicinity of Mount Stephen in British Columbia, set apart in 1886, developed into the present Yoho Park. Similarly, a reservation of twenty square miles made the same year in the Selkirk Mountains of British Columbia became Glacier Park. Ten square miles in the vicinity of the Kootenai Lakes in southern Alberta, reserved in 1895, was the beginning of Waterton Lakes Park.

From these small beginnings, the system has grown over the years. Many of the parks were created from virgin lands owned by the Government of Canada, and others—particularly in later years—have been created through the co-operation of provincial governments in turning over suitable areas to the Federal Government for establishment as national parks. The system now stretches from Newfoundland to British Columbia and from the Northwest Territories to the southernmost part of the mainland of Canada at Point Pelee, Ontario.

From their inception, the parks have served as natural museums where the native trees, plants, animals, and birds may be seen and studied in their natural state. Located across Canada, they represent a cross-section of the outstanding features of the natural landscape, the flora and fauna of the country. The reintroduction of wildlife and of trees and other plants, when this has been necessary, has been limited wherever possible to species normally found in the area. In this way, present and future generations will find in the parks species of animal and plant life that have lived for centuries in their natural surroundings. For the scientist, the parks provide ideal places for study with an almost infinite variety of living and inanimate subjects at his disposal. The protection the parks afford the wildlife has meant the conservation of species that might otherwise have become extinct. Today, wild animals such as the buffalo, bighorn sheep and Rocky Mountain goats, bears, elk, moose and deer, live and may be seen in the sanctuary of the park lands.

The large scenic and recreational parks in the mountains include Banff, Jasper, and Waterton Lakes on the east slope of the Rockies in Alberta; and in British Columbia, Kootenay and Yoho on the west slope of the Rockies, and Glacier and Mount Revelstoke in the Selkirks. These parks are areas of outstanding alpine grandeur. Individual peaks rise to heights where the heat of the Canadian summer does not



take away their caps of ice and snow. In between are beautiful valleys, covered with green forests and set with sparkling lakes. In early summer on the mountain slopes above the forests are found wild alpine flowers that reach up toward the snow. From the mighty glaciers issue streams that tumble down the mountain sides or fall in cascades over the rocky walls of gorges and canyons.

Banff, the oldest and second largest of these parks, is also one of the best known throughout the world. It contains the famous resorts of Banff and Lake Louise, and forms the hub of a system of highways and trails to outstanding beauty spots. Jasper Park, the largest of the group, adjoins the northern boundary of Banff and has many historical associations with the exploration of the west. Between these parks runs the famous Banff-Jasper Highway, one of the most spectacular roads in the world. West of the Continental Divide and adjoining Banff is Yoho Park, containing lovely Emerald Lake and Lake O'Hara, rivals in beauty to Lake Louise. South of Yoho and Banff is Kootenay Park, established in 1920 to preserve the landscape on both sides of the Banff-Windermere highway, the first motor road to be built across the central Rockies.

Westward in the Selkirks are Glacier and Mount Revelstoke Parks. Since its establishment, Glacier has been accessible only by railway, but with the completion in the next few years of the Trans-Canada Highway through Roger's Pass its numerous attractions will be opened to motor travel. Mount Revelstoke Park, a mountain-top area, situated literally above the clouds, lies on the western slope of the Selkirks and is reached by a scenic drive that climbs thousands of feet in long switch-backs from the Columbia River Valley.

In the southwest corner of Alberta lies Waterton Lakes Park, which, with Glacier Park on the United States side of the International Boundary, forms the Waterton-Glacier International Peace Park to help commemorate the happy relationship that has existed between the two countries for so many years.



The national parks of the Prairie Provinces include a vast reserve of 17,300 square miles straddling the boundary between Alberta and the Northwest Territories known as Wood Buffalo Park. Established in 1922, it contains some 12,000 buffalo in addition to many other species of wildlife. Elk Island Park, 30 miles east of Edmonton, is a fenced area of 70 square miles, forming a home for more than 1,000 buffalo, as well as moose, elk, and deer. The park has many recreational attractions. North of the Great Plains in Saskatchewan lies Prince Albert Park, containing almost 1,500 square miles and embracing a vast and historic network of lakes and streams. The entire area has

a background of romance and adventure dating from the days of the fur trade and in more recent times was the home of the celebrated naturalist Grey Owl.

Riding Mountain Park in Manitoba is a well-forested tableland over 1,100 square miles in extent, lying north of the most thickly populated

section of the prairie country. Its elevation of more than 1,000 feet above the surrounding plains, its wildlife population, and its beautiful lakes provide a unique attraction.

In Ontario there are three national parks. The most westerly is Georgian Bay Islands Park, a group of thirty islands in the Bay's famed resort region. To the south on Lake Erie is Point Pelee Park, noted for its unusual vegetation and its excellent beaches. Because of its location on one of the main flyways for birds on their annual migrations, it is one of Canada's outstanding bird sanctuaries. The third park in Ontario is in the Thousand Islands region of the St. Lawrence River, where a mainland area and twelve islands have been reserved for public use.

Four parks have been established in the Atlantic Provinces. The latest of these is Terra Nova Park in Newfoundland, set up in April, 1957. The new park area contains over 150 square miles and is representative of the rugged, forested region on the northeasterly coast of Canada's newest province. As yet undeveloped, it will be served in future by the Trans-Canada Highway, and its bold headlands jutting out toward the Atlantic should become well known to visitors from near and far.

Cape Breton Highlands Park in Nova Scotia has an area of almost 400 square miles and includes one of the most picturesque sections of Cape Breton Island. In circling the park, the Cabot Trail climbs hundreds of feet over mountain shoulders with sheer drops to the sea and provides access to numerous quaint fishing villages which lend a special charm to the region. Prince Edward Island Park stretches for 25 miles along the shores of the Gulf of the St. Lawrence. Renowned for its fine sand beaches—among the best in the world—the park provides opportunities for bathing in salt water considerably warmer in summer than regions hundreds of miles farther south. Behind its beaches lie forested and agricultural areas typical of the pastoral charm of Canada's island province.



Fundy Park in New Brunswick is another of the recent additions to the national parks group and, since its establishment in 1948, has taken its place among the most popular resorts in Eastern Canada. It is located on the Bay of Fundy, and along its shores ebb and flow the greatest tides in the world. Old covered bridges lend a special charm, and lovely fresh-water lakes offer a contrast to the salt water of the bay.

These parks, created at different times over the past seventy years, have been gradually developed until today the system offers magnificent vacation opportunities for all visitors. Roads have been and are being built, camp-grounds and picnic areas developed, facilities for bathing and for many other outdoor recreational activities constructed. A staff organization has been developed to maintain these facilities and to carry out the all important task of preserving the natural features and protecting the wildlife and the forests.

One of the earliest developments was the creation of access roads. These had to be built if the parks were to be made available to the people. They had to be built in such a way that they took the best advantage of the scenic routes they followed and at the same time caused the least possible harm to the natural appearance of the landscape. As far back as 1921 a motor road was completed from Banff to Lake Louise. In 1923 this was extended through what is now Kootenay Park to the Columbia River valley. In 1927 the road was carried from Lake Louise through Yoho Park to form an important link in what later became known as the Trans-Canada Highway. The celebrated Banff-Jasper Highway was first opened to the public in 1940. Major roads were also built in Prince Albert and Riding Mountain Parks to provide access from provincial highways, and the Cabot Trail was constructed to girdle picturesque Cape Breton Highlands Park. Today the park highway system includes about 750 miles of highways, 135 miles of secondary roads, and over 450 miles of fire roads.

The development of camping and recreational facilities has been a continuing project of major importance. Camping in the great outdoors is one of the main attractions the parks offer. Through use of the public camp-grounds, visitors can have a memorable holiday in beautiful surroundings at very modest cost. In recent years these camp-grounds have been extended and improved, and most areas now include attractively designed shelters equipped with camp-stoves, fuel, running water, and electric light. Campers may enjoy indoor recreation in community buildings during the evening or inclement weather, and special areas have been set aside and equipped for the use of visitors travelling in house-trailers.

In the mountain parks where there are hot mineral springs, swimming pools and plunge baths, equipped with dressing rooms and promenades, are in constant use during the summer season. In some other parks, outdoor pools with heated water are available, or portions of natural beaches have been set aside for bathing under the supervision of trained personnel.

Other attractions provided for park visitors include golf courses, tennis courts, and bowling greens, and special areas have been developed as children's playgrounds. Hiking and riding trails are maintained to allow access to regions of primitive beauty that can be reached in no other way. In some parks in Western Canada, winter use is growing steadily. In Banff, Jasper, and Mount Revelstoke Parks, ski slopes and runs have been developed and several ski jumps constructed. Ski lifts and tows are operated by private enterprise. Roads to ski areas are maintained all year.

Special attention has been devoted to the improvement of sport fishing by re-stocking the lakes and streams from fish hatcheries operated in several of the parks. The Canadian Wildlife Service investigates the park waters periodically in order to maintain the fish population at a satisfactory level.

Along with the development of roads, camp-grounds, and other physical facilities has been the parallel development of trained staff to take care of visitors' needs, to maintain the facilities, and in particular to ensure the preservation of the parks. A most important section of the essential operation is the park warden service. The park wardens have a long record of outstanding service to the public and on many

occasions have gone beyond the normal call of duty in risking life and limb to rescue climbers and skiers in difficulty and to fight the worst menace the parks must always face—the horror of forest fires. The service has pride and tradition. Many of its members have been with the parks for years and know every trail and canyon. Others are young men looking forward to an active life of service to the public in a calling that has its hardships, but that also has a special challenge. Often living in extreme isolation for many months of the year, the wardens have a heavy responsibility in protecting the parks from damage by the forces of nature and, on occasion, by human hands. They are trained for their tasks under the guidance of the senior wardens and at special schools held in the parks with courses given to a large extent by the more expert members of its own service.

The responsibility for the work of preserving, developing, and administering the parks is placed by the National Parks Act under the Minister of Northern Affairs and National Resources, and, through him, with the National Parks Service of the department. Local administration of the parks is carried out by resident superintendents assisted by professional, technical, and administrative staffs. The superintendents must plan and inspect all park activities; manage park townsites, maintain and operate municipal services, control sanitation and public health; manage park lands; protect the forests, game, and the natural landscape; manage recreational features; and control business activities.

The National Parks Service is assisted in its work by technical advice from the Canadian Wildlife Service and from the federal Forestry Branch. Engineering projects in the parks are carried out by the Engineering Services Division of the National Parks Branch with major highway contracts and certain other major engineering works being supervised on behalf of the National Parks Service by the Department of Public Works.

The establishment and development of the parks have been accompanied by a growing interest on the part of the public. Back in 1911, for example, the number of visitors was less than 100,000, and in 1920 only about 150,000. By 1930 the figure exceeded 540,000 and in 1940 passed the million mark. After a temporary drop during the war years, the attendance rose to 1,795,000 in 1951 and in 1956 exceeded 3,500,000. It is of interest to note that about three out of every four visitors are Canadians.

The facilities now provided in the national parks—with the possible exception of tourist accommodation—may be said to meet the most pressing needs of visitors on the basis of current attendance. However, with the increase in the country's population that may be expected in future years, expansion of park facilities and visitor amenities must be provided if the parks are to fulfil adequately the functions for which they were established.



The population of Canada on March 1, 1957, was estimated by the Dominion Bureau of Statistics at 16,420,000. This is an increase of approximately 2,410,000 or 14 per cent since 1951. During the same period, however, the annual number of visitors to the national parks has gone up by about 84 per cent. Assuming that the population of Canada will reach 25,000,000 by 1975, it is reasonable to expect that the number of park visitors will be in the neighbourhood of 7,000,000. This may well be the yardstick for future development. Such expectations, while a splendid measure of the value of the parks to Canada, all point the way toward many problems that will have to be solved if the parks are to continue to give their full value in future years.

To ensure that adequate planning can be carried out to meet the large anticipated increase in park use, a special planning division is being established within the National Parks Branch. This division will be responsible for gathering data and preparing plans for the development of the parks on a long range basis. This is an essential task if facilities are to be developed to meet the increased need and at the same time steps taken to make sure that use patterns do not develop in such a way as to impair the natural state.

One of the major difficulties created by increased use is the problem of highway maintenance. Many of the park highways were built some years ago when even present levels of attendance were not dreamed of. These old roads will not carry in safety the heavy traffic volume now encountered. This problem has become acute in the past few years, and it has been necessary to commence a major program of trunk highway reconstruction. This has now been in operation for two years and will take another eight years to complete. By 1965 it is expected that some 450 miles of trunk highways will have been constructed or rebuilt to a new standard that should meet traffic volumes expected for many years to come. The cost of the work will exceed \$60,000,000. Eight national parks will be affected, and the work will be carried out on a priority basis, taking into consideration the condition of the existing highways and the traffic problems associated with each avenue of travel. For the present, reconstruction is concentrated on four major trunk highways, the Banff-Jasper Highway in Banff Park, the Banff-Windermere Highway in Banff and Kootenay Parks, the Cabot Trail in Cape Breton Highlands Park, and the Gulf Shore Road in Prince Edward Island Park. This work will cover 217 miles in all.

In addition to this special park highway program, a total of 116 miles of the Trans-Canada Highway will be constructed through Banff Park in Alberta, and Yoho, Glacier, and Mount Revelstoke Parks in British Columbia. By early 1957, the entire stretch of road through Banff and Yoho Parks had been completed or was under contract. It is planned to have the road surfaced with two courses of asphalt by the autumn of 1958. Surveys are now being undertaken by the Governments of Canada and British Columbia to locate the Trans-Canada Highway from Golden to Revelstoke over Roger's Pass in the Selkirk Mountains. The total distance is 90 miles, of which 28 will be within Glacier Park and 8 miles within Mount Revelstoke Park. It is expected that clearing will be completed in 1957 and heavy construction commenced in 1958. Because of the exceptional engineering problems, the road will not likely be completed before 1962.

A further major difficulty that is being created by increased use, and that will be accentuated in years to come, lies in the proper use of park lands. Under the National Parks Act, and indeed under the fundamental concept of national parks, lands within the parks cannot be sold. On the other hand, it would be both unwise and impractical for the government to provide all facilities required within the parks. The provision of accommodation apart from camp-grounds has therefore been left to private enterprise.

Transportation services, gasoline stations, stores and other businesses required to serve the visitors have similarly been left in private hands. As land needed by the services cannot be sold to the operators, the practice has been to make the land available to them on a long-term basis with the right to hold a lease being given on the basis of competitive bids open to the public. Through the leases and other regulations it is possible to control the use to which the land is put.

Out of these arrangements, however, are bound to come problems, and solutions are constantly being sought. Obviously any buildings erected in the parks impair their natural state and would seem to be contrary to the governing Act. On the other hand, the parks must be made available. This basic contradiction must always be resolved in such a way that the impairment is kept at the lowest possible level consistent with the need to make the parks accessible, in the practical sense, to visitors. Buildings and other installations that form part of essential facilities to meet visitor needs have therefore a legitimate place in the parks. As park use grows, the need to make this distinction on an ever more careful basis will become more and more important.

A case in point is the leasing of land for privately-owned summer cottages. Years ago, when the population of Canada was much smaller and the numbers using the parks were much less, there seemed to be ample space in the parks to take care of all, and certain choice areas were set aside for private cottages. It is now realized that this was a serious mistake, and we find in some of the parks today some of the best areas, while not privately owned, at least effectively blocked off for many years from public use. Today no more cottage sites are being leased.

For reasons of convenience and economics, services to the public tend to gather at some central point or points in a park. This natural tendency has led to the development of townsites in a number of parks. The management and control of the townsites presents one of the most difficult problems for which a complete solution has not as yet been achieved. This must be done if the parks are to be preserved for the future. The operators of eventual services quite naturally look for the greatest possible freedom in conducting their businesses—or at least the same degree of freedom that they would find outside the parks. On the other hand, special controls of many kinds are required to ensure that impairment of the natural features of the parks is always kept at the



lowest possible level. Because the parks comprise a system, it is essential to have regulations that are consistent throughout, and the application of general regulations that are satisfactory for the great majority of the parks sometimes creates special difficulties for certain parks. There is, therefore, a continual effort to find solutions which satisfy park needs and at the same time meet requirements of private enterprise within the parks.

A townsite problem that follows naturally from the leasing system is the question of housing. Persons operating businesses in the parks must have accommodation for themselves and their staffs. It is therefore normal practice to lease land to those persons who must live in the parks in order to serve the visitors. At present such leases may be transferred to other parties who do not need the land for this purpose. As a result, many persons have acquired property from leaseholders within the park townsites for private purposes, and not with the intention of serving visitors' needs. These people in turn create a demand for goods and services which leads to further pressure for the opening up of new areas for accommodation.

This circle of supply and demand results in the expansion of park townsites beyond the minimum required for park purposes, and means, in effect, that land is being taken out of general public use. One solution would be to limit the rights of lease transference so that persons could hold leases only if the need for their living in the park could be demonstrated. This solution could, however, create difficulties for the present leaseholders, and the problem is therefore being studied in an attempt to find a solution which will adhere to the principle of the National Parks Act and meet the long-term needs of parks development and, at the same time, be fair and reasonable to all.

A further problem in park townsites is the question of the municipal rights of citizens. As the park land is owned by the Federal Government and as special controls are essential in almost every phase of the management of the parks and townsites in them, municipal governments as such do not exist within the park. This means that townsite residents do not have voting rights as they would have in normal municipalities, nor do they have the same control over taxation or expenditures. Generally, taxes are lower in the townsites than in similar communities outside the parks, but this does not compensate completely for the natural wish of townsite citizens to have a voice in the conduct of affairs that so closely affect them. This problem has been partially solved in Banff and Jasper where local representative bodies advise the department on matters of local concern. This is not a complete solution by any means, and a good deal of work must yet be done on the problem to find a solution that will meet the requirements of the Act and also meet the reasonable wishes of the citizens.

At the present time, and even more in the future, there is and will be a need to provide accommodation for visitors to the parks. The National Parks Service provides the camp-grounds, but it is left to private enterprise to provide other forms of accommodation such as hotels, motels,

and bungalow camps. One of the main studies now being conducted will determine the need for such added accommodation now and in future and should indicate the best locations for these developments. In many cases it will be advisable to encourage the erection of units at some distance from existing townsites so that visitors will have the full opportunity to benefit by the open spaces and be able to escape from the more crowded and urban conditions that necessarily develop in the park townsites.

This practice, however, leads to a further problem, for such outlying developments could become numerous with the passing years and there would be the danger that few areas would remain in their truly primitive state for visitors to see. There are still many persons, though probably not in the majority, whose intense interest in the parks is based on the desire to get away completely from normal living conditions, and to these even the provision of a road leading into a wilderness area is a destruction of natural beauty and a lowering of the park's value.

To meet the wishes of these many people, consideration is being given to the setting aside, in at least those parks where it is practical to do so, of wilderness areas which would be maintained in perpetuity in a completely natural and primitive state. These areas would not have to be large but would have to be of sufficient size to contain natural features of interest and scenic value. No roads would be built through these sections, nor would any buildings be permitted other than those required for protection staff and for the safeguarding of human life. With large areas of the parks now open to motor travel and subject to potential development for visitor use, it seems reasonable that some remaining areas of true wilderness be preserved before their present unspoiled state is lost forever.

Apart from finding solutions to development and management problems, there is a need for a greater dissemination of information about the parks and what they mean to Canadians. The press, radio, television, and other information media have done an admirable job of acquainting the public with Canada's national parks and their purposes. It is hoped that this will be continued and extended to encourage a greater appreciation of the value of these natural playgrounds.

Canada's varied and outstanding natural attractions, so well exemplified in the national parks, should be regarded not only as resorts but also as a public trust, to be conserved for the benefit of the greatest possible number of people. The grandeur of the park landscape, the scientific interest of the forests, wildlife, and geological forms, and the natural relationships of plant and animal life can be maintained only if the lands and waters comprising the parks are kept unchanged. As natural resources outside the parks continue to be exploited for commercial use, the intrinsic value of parks increases immeasurably. Beautiful scenery, varying climate, and wildlife in many forms can be used



over and over again; can be drawn upon in perpetuity without impairment of the original capital, and still remain a permanent natural resource, provided adequate protection, maintenance, and supervision are faithfully continued.

Periods of relaxation and recreation, preferably in the great outdoors, are universally recognized as the antidote to the pressure of modern living. On a per capita basis, no other country has done more than Canada to provide national parks for the healthful enjoyment of its people and its guests. Well managed and wisely used, these parks will help in no small measure to ensure the future health and well-being of the nation.

Annual Report of the Department of Northern Affairs and National Resources

Northern Administration and Lands Branch

The Northern Administration and Lands Branch administers Eskimo affairs and natural resources in the Yukon and Northwest Territories, and manages certain Crown lands and mineral rights in the provinces.

It administers the Northwest Territories under the Northwest Territories Act (R.S.C. 1952). Since there is no territorial civil service, it performs all administrative functions. The Annual Report of the Commissioner of the Northwest Territories appears as Appendix H.

The Branch also administers the Yukon Territory under the Yukon Act (R.S.C. 1952). A territorial civil service under the Commissioner of the Territory performs the administrative functions. The Annual Report of the Commissioner of the Yukon Territory appears as Appendix I.

Territorial Division

The Territorial Division administers the Mackenzie District of the Northwest Territories on behalf of both the Federal and Territorial Governments. It also acts for the Territorial Government throughout the remainder of the Territories, either directly or through other agencies, and is responsible for the administration of Wood Buffalo National Park. In respect of the Yukon Territory, the Territorial Division advises on and co-ordinates federal activities, including the exercise of general supervision over the affairs of the government of the Yukon Territory.

Field offices are maintained throughout the Mackenzie District, at various points in the Yukon Territory, and in Edmonton, Alberta.

There are three principal levels of government in the territories, i.e., federal, territorial (quasi provincial), and municipal, each with its own legislative powers, but the allocation of functions and division of financial responsibilities between the levels of government are not entirely the same as in the case of the provinces. The Federal Government has retained the control and management of natural resources except game. In each territory there is a legislative council which, except in respect of natural resources, has legislative powers roughly analogous to those of a provincial legislature. These councils have enacted municipal legislation under which certain powers over purely local matters are delegated to local municipal government bodies in accordance with the usual provincial pattern.

Northwest Territories

The Council of the Northwest Territories consists of nine members, five of whom are appointed by the Federal Government and four of whom are elected every three years, one from each of four constituencies in the Mackenzie District. The Council usually meets twice each year, once

in Ottawa and once in the Territories. In August, 1956, it made history when it met at Aklavik (East 3), the first time a meeting had been held north of the Arctic Circle. A Commissioner appointed by the Federal Government is responsible to the Minister of the Department for the administration of the government of the Territories. This appointment is held by the Deputy Minister of the Department.

With the exception of the employees of the Territorial Liquor System, no civil service is maintained by the government of the Northwest Territories, and all administrative functions are carried out either directly or indirectly by the Territorial Division. These include the administration of legislation and policies of the Council relating to such matters as game management and conservation, forest protection, health, welfare, labour, municipal affairs, liquor, professional and business licensing, motor vehicle control, taxation, and workmen's compensation. A review of activities in these fields is contained in the Annual Report of the Commissioner of the Northwest Territories which appears as Appendix H to this report.

Aklavik Relocation. The town plan for the new site was completed and approved during the year. The Department continued work on the construction of roads and on a construction camp housing and service buildings preparatory to the commencement of major projects in the summer of 1957. The financial basis to be used in computing compensation for residents at Old Aklavik for their property was settled, and officials of this Department and the Department of Public Works assessed all properties in the community for compensation purposes. In many cases, negotiations with the property owners were completed.

Yukon Territory

The Council of the Yukon Territory consists of five members, all of whom are elected every three years. A resident Commissioner appointed by the Federal Government is responsible to the Minister for the administration of the government of the Territory, and the administrative functions are carried out by a territorial civil service. The Territorial Division examines and reports on all Yukon legislation and policies, and acts in an advisory capacity on Yukon territorial matters generally.

A review of the activities of the Territorial Government is contained in the Annual Report of the Commissioner which appears as Appendix I to this report.

Wood Buffalo National Park

The increase in importance of the forest resources of Wood Buffalo Park, one of the largest national parks in the world, resulted in greater emphasis being placed on fire prevention and fire suppression measures. New fire towers and ranger patrol cabins were constructed, and the roads and trails throughout the Park were improved. There were four fires, compared with sixteen in 1955, and 49,427 acres were burned.

An aerial survey carried out by the Canadian Wildlife Service indicated the number of buffalo in the Park to be in the neighbourhood of 12,000 to 14,000. The customary annual slaughter of buffalo for the purpose of maintaining the herds at a reasonable level, which had previously been held at the Hay Camp, did not take place because of a

transfer of activities to Lake Claire, which does not yet have adequate plant facilities. However, construction was commenced on a modern abattoir and walk-in freezer at Lake Claire, and it is expected the annual slaughter will be resumed in 1957-58.

Arctic Division

Greater penetration into the Arctic from the south, an unstable and precarious fur market, a decreasing game supply, and an increasing Eskimo population combined to alter the long-established patterns of Arctic life more rapidly than ever before. Many Eskimos took advantage of the unprecedented opportunities for wage employment, and in many communities the shift from the traditional trapping-hunting economy was sharp.

A widespread search for minerals gave part-time employment for many Eskimos and permanent employment for some. There was also employment on the DEW and Mid-Canada lines, in transportation and communications, in government construction, and with the traders and missionaries.

For a people long used to an existence based on hunting and trapping, wage employment brought many stresses of adjustment, and this was the essential problem to which much of the Division's activity was directed during the year. Remote control was no longer good enough.

Field Staff

Field staff had to be increased. Northern Service officers are now posted at communities across the Arctic—at Frobisher Bay, Cape Dorset, Fort Chimo, Great Whale River, Churchill, Baker Lake, Tuktoyaktuk, and Cambridge Bay. Their work is as varied as the areas in which they are stationed. Some are assigned to the DEW Line, where they provide guidance and assistance to Eskimos newly taking up wage employment. Others are helping with the transition in different settings. Yet others are assigned to the remotest areas of the Arctic, where the full impact of an industrial society has yet to leave its impression on the people.

During the year, too, the Arctic gained its first social worker. Others will soon follow him, for the problems of the changing life are social no less than economic.

Ottawa Administration

Welfare operations will be guided from Ottawa, where heavy emphasis has recently been placed on the need for these services, not only in the Arctic but among the Arctic people hospitalized in the south. About 1,000 Eskimos, roughly 10 per cent, are now receiving hospital treatment in the south. To meet the needs of these people while in hospital and on their difficult return home, a unique welfare program has begun with the co-operation of the Indian and Northern Health Services of the Department of National Health and Welfare.

Hospital progress reports, tape-recorded messages, and photographs are sent to relatives in the north and, when possible, obtained in the north for relatives in hospital. This is being done at least four times a year. Eskimo-speaking representatives of the welfare section also visit Eskimo hospital patients in the south and help doctors and nurses in their understanding of the Eskimos, many of whom speak no English.

The rehabilitation centre at Frobisher Bay was nearing completion at the end of the year. When complete, the centre will include thirteen buildings, some of which will serve as kitchen-dining rooms, bathhouse-laundries, and workshops. The remainder will be occupied by former Eskimo patients who for various reasons are no longer able to support themselves on the land. After developing special skills at the centre, they will once again become productive members of society.

Many projects, mainly experimental, seek to expand and diversify the Eskimo economy. Handicrafts have been encouraged in many northern communities. The estimated financial return to the Eskimos for their remarkable carvings approached \$100,000 for the fiscal year. The production of authentic handicrafts has a real, if abstract, value in providing the Eskimos with a means of cultural self-expression.

The total count of reindeer at the annual autumn round-up was 6,010. Losses through straying were reduced to 376 from the 1955 figure of 1,231. Research was begun on health, herding methods, and utilization. The reindeer are now divided into four herds: one owned outright by an Eskimo, two managed by Eskimos, and a main government herd.

Experiments in eiderdown collecting and use for clothing were continued at Payne Bay and Cape Dorset, and several prototypes of garments were made to set a pattern for an Eskimo garment-making industry in these areas.

Experiments in tanning sealskin were carried out with fair success, indicating a possibility of establishing local industries.

Research data were assembled on usable marine life resources of the Arctic, and arrangements were made to carry out field experiments during the summer of 1957.

In co-operation with the Department of Agriculture, experimental raising of sheep was continued at Fort Chimo. Experiments in test plots for forage crops were continued, but conclusive results were not obtained owing to an exceptionally poor growing season. A small flock of domestic geese was introduced and raised successfully on tundra vegetation. Many were carried over during the winter, and incubation experiments will be conducted. A flock of 50 hens was maintained during the winter, and these produced a total of 1,481 eggs. Produce was supplied to Eskimos.

Under the Eskimo Loan Fund, Eskimos continued to obtain financial assistance for local projects of direct economic benefit to them.

Patrols and Inspections

Early in the year, visits were made to settlements in the Central and Western Arctic. During the summer the same tasks were carried out in the Eastern Arctic, aboard the C.G.S. "C.D. Howe."

Mining and Lands Division

Exploration and Development

Interest was high and exploration active in such widely separated parts of the north as the Coronation Gulf area and the Arctic and Hudson Bay Mining District, with a continuation of exploratory and development programs for oil and gas in the southwestern part of the Northwest Territories and an increase in the oil and gas exploratory and development programs in the Eagle Plains Reservation area of the Yukon Territory.

Mining¹—Northwest Territories

Mineral claim staking continued at a high level with 10,292 claims recorded. Exploration was conducted in eight different localities with considerable interest in the mineral potentialities of the Arctic and Hudson Bay Mining District developing toward the end of the year. Greatest attention was given copper-nickel, iron, silver-lead-zinc, with development taking place on uranium showings, copper-nickel, and iron. There was some interest in the possibilities of lithium development.

Gold production increased slightly in value, but the value of radioactive mineral production was lower. Ore reserves increased at the three producing gold mines, and operations continued at a normal pace at the one producing uranium mine. Underground and surface development at another uranium property and at a copper-nickel property indicates production in the summer of 1957.

Interest developed in the Coronation Gulf area of the Yellowknife Mining District, and the following three reservations were granted: the Coppermine Mountains Reservation, approximate area, 500 square miles; the Coppermine River Reservation, approximate area, 600 square miles; and the James River Reservation, approximate area, 620 square miles.

A geochemical survey of 2,100 claims staked the previous year in the Sulphur Bay area was followed by a diamond drilling program. Diamond drilling was performed along the south shore of the east arm of Great Slave Lake in the hope of locating a commercial copper deposit.

A geophysical survey and a diamond drilling program were carried on along the Copperneedle River on the west coast of Hudson Bay. Mineral claims were staked to the southwest of this area.

On the Belcher Islands, the report of disseminated copper in diamond drill holes overlying the iron deposits created renewed interest in the economic possibilities of developing the mineral claims previously staked at that location. Approximately 1,100 mineral claims were staked on the islands adjoining the Ungava Nickel Belt. Diamond drilling is being planned for the summer of 1957. Mineral claims were recorded covering iron possibilities of the Nastapoka Islands not held under Crown Grant. An iron showing previously located in 1919 at the west end of Foxe Peninsula on Baffin Island was re-staked. Exploration in the form of reconnaissance work was commenced in other areas of southern Baffin Island, and exploration and development work is forecast in the Coronation Gulf area on the west coast of Hudson Bay from the Manitoba border north to Chesterfield Inlet, and in the islands along the east coast of Hudson Bay and along the southern coast of Baffin Island.

Mining¹—Yukon Territory

Although placer gold mining activity continued, the value of minerals produced from lode mining surpassed the value of the placer gold. The major gold producer continued dredging and hydraulic work, and three other major companies were active in the Dawson Mining District. Asbestos exploration commanded attention in the Dawson Mining District when a deposit at Cassiar Creek was found to contain short fibre asbestos and another find of asbestos on Clinton Creek was reported to contain a better grade with longer fibres. Throughout the Dawson District, geophysical work was carried on by a major asbestos corporation.

¹ See Appendix B, Nos. 1 to 5.

The major silver-lead-zinc producer in the Mayo Mining District increased ore reserves as well as the value of mineral production, and another mining company quadrupled its ore reserve tonnage. Mill capacity was increased during the year. Several known occurrences of copper were investigated.

A limited amount of development work was conducted in the Whitehorse Copper Belt in the Whitehorse Mining District. Work was commenced on a new adit at Tantalus Butte Coal Mines to increase reserves and maintain production.

Lands, Timber, and Grazing¹

Northwest Territories

The number of land sales, agreements of sale, and leases was slightly less than the previous year, and revenue dropped 50 per cent owing to the termination of an agreement of sale between the Crown and the Municipal District of Yellowknife. The final payment of \$10,835.50 was made in March 1956.

There was an increase of approximately 50 per cent in the number of timber permits issued. Revenue from timber operations almost trebled owing chiefly to the cutting of approximately 11 million feet of timber on one berth on the Peace River in Wood Buffalo Park.

Yukon Territory

The total number of land transactions including sales, agreements of sale, and leases showed a small decrease, but the revenue from these sources increased approximately 6 per cent. A subdivision of some 200 lots at Whitehorse was turned over to the Territorial Government for disposal.

Although there was a small decrease in the total number of timber permits issued, the quantity of timber cut was considerably larger than the previous year.

Public Lands in the Provinces

Progress was made in reporting the land held by this Department to the Central Office of Record, established under the Department of Public Works, and in reporting land and buildings to the Municipal Grants Division of the Department of Finance.

Dominion Land Records

Approximately 300,000 homestead and pre-emption files relating to land in Saskatchewan were shipped to the Saskatchewan Archives during the year, and about 200,000 similar files relating to land in Alberta were shipped to the Registrar of Lands for Alberta. One hundred and twenty drawers of files relating to land in the British Columbia Railway Belt and the Peace River Block were sent to the Public Archives in Ottawa. This reduced old Dominion Lands records in the custody of the Department to general ruling and policy files and those land files on which there still remained seed grain indebtedness.

Inquiries regarding early western settlements, half-breeds, and special grants were dealt with, and 381 certified copies of Land Patents were prepared on request.

¹ See Appendix B, Nos. 3 and 4.

Seed Grain, Fodder, and Relief Indebtedness¹

Good progress was made in reducing the number of outstanding accounts for advances of seed grain, fodder and relief made to homesteaders and early settlers in Western Canada. The Seed Grain Advisory Boards for Alberta and Saskatchewan made a total of 1,680 recommendations for reductions and write-offs, and two accounts were paid in full. A total of \$556,319 was written off, and \$39,745 was received in payments. The number of outstanding accounts has been reduced to 89 Federal and 272 Joint Federal-Provincial in Alberta, and 653 Federal and 1,680 Joint Federal-Provincial accounts in Saskatchewan.

Oil and Gas

Northwest Territories and Yukon Territory

Five public competitions were held for the acquisition of 112 oil and gas exploratory permits in the Northwest Territories, and 72 permits were granted as a result. A total of 94 exploratory oil and gas permits covering an area of 4,784,918 acres were granted.

Exploration for oil and gas in the Northwest Territories and Yukon Territory continued at a good rate. A drilling rig, equipment, and supplies were taken into the Eagle Plains Reservation in the Yukon, preparatory to the commencement of drilling in April 1957. Several companies completed geological and geophysical examinations in the Northwest Territories, and one company completed a second gas well a mile and a half northeast of the 1955 discovery well.

In the Northwest Territories eight wells were drilled, of which four were completed as development wells at Norman Wells, one was suspended as a gas well, and the remaining three were abandoned. There were also 103 structure test holes drilled. Three geological and two geophysical parties worked in the Northwest Territories, and two geological and one geophysical party worked in the Yukon Territory.

Provinces

Six public competitions were held for the purchase of leases of the oil and gas rights underlying 41 parcels in Manitoba, 30 in Saskatchewan, and 13 in Alberta. As a result of these competitions, 29 leases in Manitoba, 28 in Saskatchewan, and 12 in Alberta were granted. One public competition was held for the outright sale of the mineral rights underlying seven parcels of land in Ontario and one parcel in Alberta.

Royalty was received from nine wells in Manitoba and four wells in the same province in which the Crown owns a partial interest, two wells in Saskatchewan, and one in Alberta.

Works and Services

Largest single project of the year was the work done on the southerly 40 miles of the extension of the Mackenzie Highway from Hay River to Yellowknife, involving an expenditure of \$1,291,826; this was more than 88 per cent of the total amount expended on road construction in the Northwest Territories. Maintenance on the Mackenzie Highway used up 73 per cent of the \$102,601 spent on maintaining territorial roads.

¹ See Appendix B, No. 6.

Construction and improvement of buildings cost over \$3,800,000 and extend all the way from the new site of Aklavik to Frobisher Bay and from Lake Claire in Wood Buffalo Park northward to Cambridge Bay.

Over three-quarters of a million dollars went into the construction of roads and bridges and maintenance work in the Yukon Territory. Building construction added another \$42,000 to works expenditures in that area.

Particulars of expenditures on roads and buildings are set out in Appendix B.

Education Division

The Education Division administered educational and vocational training programs for the Northwest Territories. Although the education of white children and children of mixed blood was the responsibility of the Territorial Government, the Department provided the necessary administrative services. In return for such services the Territorial Government compensated the Federal Government on the basis of an annual per pupil grant. By special arrangement with the Indian Affairs Branch of the Department of Citizenship and Immigration, the education of Indians resident in the Northwest Territories became the responsibility of the Department.

In the Mackenzie District, apart from Eskimo territory, the Department operated schools at Fort Smith, Fort Resolution, Rocher River, Hay River, Fort Liard, Jean Marie River, Fort Simpson, Fort Norman, Fort Franklin, Fort Good Hope, Arctic Red River, Fort McPherson, Aklavik, and Aklavik East 3. Summer schools for Indians were conducted at Lac la Martre and Fort Wrigley. In March 1957 there were 2,191 pupils enrolled in the various types of schools in the Mackenzie District. These schools included 18 federal day schools, 3 mine day schools, 1 public school, 1 separate school, 4 residential schools, 1 mission day school, and 4 hospital schools. According to racial origin, 673 pupils were of white status, 695 were Indian, 317 were Eskimo, and 506 were of mixed blood. Of these pupils, 1,107 were boys and 1,084 were girls.

In the field of Eskimo Education the Department operated schools in the Northwest Territories at Tuktoyaktuk, Reindeer Station, Coppermine, Cambridge Bay, Baker Lake, Chesterfield Inlet, Coral Harbour, Cape Dorset, Frobisher Bay, and Pangnirtung, and in the Province of Quebec at Port Harrison and Fort Chimo. A permanent school hostel at Chesterfield Inlet for the accommodation of 74 Eskimo children from outlying areas was operated by the Roman Catholic Mission. At Coppermine a tent-hostel for 36 Eskimo children from the surrounding area was operated by the Anglican Mission. These hostels were operated in conjunction with the local federal day schools. Some 500 pupils were enrolled in day schools in Eskimo territory. In addition, 224 Eskimo pupils were enrolled in the various schools in Old and New Aklavik.

Arrangements were continued for the maintenance and education of Eskimo children in the Anglican and Roman Catholic Residential Schools at Aklavik, N.W.T., and Fort George, Quebec. In a number of settlements in Eskimo Territory, schools were operated on a part-time basis by missions of the Anglican and the Roman Catholic Churches. A part-time school was also conducted by the Canadian Interior Mission at Maguse River, N.W.T. Upwards of 400 Eskimo children received some education in these part-time schools.

The Department provided one teacher each for patients in Ste. Anne's Hospital at Fort Smith, St. Joseph's Hospital at Fort Resolution, St. Margaret's Hospital at Fort Simpson, and All Saints' Anglican Hospital at Aklavik.

In the field of vocational training, training was provided for 193 persons through the media of on-the-job training, apprenticeship, and other types of vocational training, both within and outside the Northwest Territories.

Extensive local training programs in carpentry, electricity, and heavy equipment operation were held at Aklavik and Fort Smith, N.W.T. In all, training was carried out in 39 vocational fields. Emphasis was placed on training of Eskimos in the operation and maintenance of heavy equipment.

National Parks Branch

The National Parks Branch is comprised of four divisions: the National Parks Service, the National Historic Sites Division, the Engineering Services Division, and the Canadian Wildlife Service.

National Parks Service¹

The National Parks Service is responsible for the administration, development, and maintenance of the national parks. Park townsites were operated and maintained, and improvements were made to camp-grounds, trailer parks, and recreational facilities. A substantial portion of the funds voted by Parliament was used to continue the park highway improvement program inaugurated several years ago, and to improve and extend bridges, trails, and telephone lines.

Progress was made in negotiations for the establishment of a national park in Newfoundland, and arrangements were completed for the conveyance by the Provincial Government and the acceptance by the Federal Government of title to an area facing Bona Vista Bay between Newman Sound and Clode Sound, on the northeastern coast of the province.

Visitor attendance continued to increase, and a new record of 3,529,976 visitors was established, an increase of 224,827 over the previous year. The greatest increase was registered at Jasper Park, and substantial gains were also made at Banff, Cape Breton Highlands, Kootenay, and Waterton Lakes Parks. Good progress was made on the reconstruction of the Trans-Canada Highway through Banff and Yoho Parks as well as on the Banff-Jasper Highway, which is being reconstructed north from Lake Louise station. Work was continued on the Banff-Windermere Highway and on the Cabot Trail in Cape Breton Highlands Park.

Projects were undertaken by the National Parks Service and by private enterprise to improve facilities for visitors and residents. In Banff Park, construction was commenced on a 45-bed hospital by the Sisters of Saint Martha. The Department of National Defence completed the construction of fifteen cadet and six N.C.O. staff buildings at the National Cadet Camp near the Town of Banff. The New Brunswick School of Arts and Crafts completed construction of two buildings in Fundy Park.

Good progress was made on the extension of the new trailer park at Tunnel Mountain in Banff Park where a sewer main with half a block of sewer connections was installed. In addition, the foundations and frames of two service buildings were erected. This area will eventually accommodate 264 trailers. Several outdoor fireplaces, kitchen shelters, and buildings providing sanitary and laundry facilities were constructed at camp-grounds and picnic grounds at various locations in the parks.

The increase in the number of visitors to the parks was reflected in the increased use of recreational facilities. At the Upper Hot Springs Pool in Banff Park, 159,370 persons enjoyed the facilities, compared to 145,782 last year. At the Miette Hot Springs Pool and Jasper Townsite Pool, attendance reached 54,608 and 26,141, compared to 40,536 and 21,767 respectively in the previous year. Attendance at the Radium Hot Springs Aquacourt in Kootenay Park was also higher.

¹ See Appendix C, Nos. 1 to 4.

In Banff Park, the Banff Indian Days Celebration was held from July 19 to 22, the Banff Winter Carnival from February 14 to 17, and the International Collegiate Ski Meet on February 2 and 3. Other events included the annual Trail Ride of the Canadian Rockies, the Banff Bonspiel, and other winter sports events. In Jasper Park the annual Sports Day was held on May 21, and the Jasper Rodeo and Turf Club outing from August 4 to 6. A group of local citizens presented "The Jasper Story," a special pageant depicting the exploration and settlement of the Athabasca Valley. The Wally Byam Caravan from the United States, consisting of 67 trailers, visited Jasper and Waterton Lakes Parks. Golf, bowling, and tennis tournaments were held in Prince Albert and Riding Mountain Parks.

Thirty wardens attended a Park Wardens' Training School at Cuthead Creek in Banff Park for two weeks starting on June 1. During October, a Mountain Climbing and Rescue School, attended by 49 park wardens and members of the Royal Canadian Mounted Police, was held at Cuthead. A First Aid Instruction Course was given to 27 park employees in Banff by an instructor from the St. John's Ambulance organization. A refresher course for park wardens was held in Jasper Park from April 19 to May 5, and a conference of park accountants was held in Banff Park from February 4 to 6. Sixteen park wardens attended an administration course held in Banff Park from March 11 to 17.

Forest fire losses from 34 forest fires, which burned 174.5 acres, amounted to \$818.75 in timber value. Forest fire protection costs were \$418,803.80. Of the total number of fires, lightning caused 10 or 29.4 per cent, smokers and camp-fires nine fires or 26.5 per cent, and railway operations and various public works 11 fires or 32.6 per cent. The remaining four fires started from miscellaneous human agencies. Fire danger measurement stations were operated during the fire season in Banff, Jasper, Yoho, Waterton Lakes, Prince Albert, Riding Mountain, Fundy, and Cape Breton Highlands Parks.

The present status of forest insect and disease infestations was studied by the Forest Insect and Disease Survey and the Forest Biology Division of the Department of Agriculture.

In the interests of range management, 353 buffalo, 486 elk, and 150 moose were slaughtered in Banff, Jasper, and Elk Island Parks. The meat and hides were sold by tender or donated to the Indian Affairs Branch. At Point Pelee, 2,022 muskrat were trapped and pelted.

Park hatcheries distributed in park waters approximately 370,000 trout of various species. Riding Mountain National Park waters were stocked with rainbow trout, eastern brook trout, and yellow walleye, supplied by the Manitoba Fisheries Branch. Salmon and brook trout released in Cape Breton Highlands and Fundy National Parks were supplied by the Department of Fisheries. A generous supply of trout eggs was donated to the National Parks Service by the States of Pennsylvania and New Hampshire and by the Manitoba Fisheries Branch.

National Historic Sites Division

The National Historic Sites Division is responsible for the operation and maintenance of 14 national historic parks and for the care and preservation of more than 525 national historic sites and plaques erected throughout Canada. The Historic Sites and Monuments Board of Canada,

an honorary body of representatives from each province, advises the Minister on the commemoration of places or persons including buildings or structures of national interest by reason of age or architectural design.

During the fiscal year the Citadel at Halifax, N.S., was established as a national historic park; the Alexander Graham Bell Museum at Baddeck, N.S., was formally opened to the public; and work was commenced on the partial restoration of Fort Langley, B.C., and the old rectory at Batoche, Saskatchewan. Negotiations were begun for the transfer to the Federal Government of the Evangeline Park at Grand Pré, N.S., and Signal Hill, St. John's, Newfoundland, to be developed as national historic parks. By the terms of a new lease of Lower Fort Garry to the Motor Country Club, public access to this national historic park was permitted.

Engineering Services Division

Engineering services were carried on through the supervising engineers at Halifax, Banff, and Ottawa. Water and sewer systems and other engineering works in the national parks were designed. The necessary technical supervision was provided for these and for all problems in connection with maintenance of roads, water systems, sewage systems, chlorination, and soil and foundation conditions. Recommendations were examined and prepared on all buildings and structures planned for erection in the national parks by private individuals and commercial concerns.

Surveys were undertaken for road location, site planning, the relocation of such public services as telephone lines, sewers, water works, electrical power lines, timber berths, and for enlarging parks or establishing new parks and historic sites.

Professional advice was provided on the purchase of equipment, and technical personnel selected and trained.

The Engineering Services Division prepared requirements for projects beyond its resources, such as major highway and bridge works and large structures which are handled for the Branch by the Department of Public Works.

Canadian Wildlife Service

The annual studies of waterfowl populations and productivity were carried out throughout Canada in co-operation with the U.S. Fish and Wildlife Service and provincial and other game agencies. An effort was made to develop adequate aerial census methods by studying on the ground the movement and activity of ducks at various times of day. Factors affecting the production and survival of ducks were investigated.

Studies and surveys of rare and threatened bird populations were participated in. Surveys of the known nesting areas of the whooping crane were conducted in co-operation with the U.S. Fish and Wildlife Service. A representative was appointed to an International Whooping Crane Advisory Group.

Surveys and spring counts of woodcock and snipe were again carried out in the eastern provinces. Also, in April and May, 1956, a survey and count of migrating Canada geese was completed. Among the co-operating agencies in both surveys were the Wildlife Management Institute, provincial game departments, and the Royal Canadian Mounted Police. Many unofficial volunteers also participated.

A special study of the limnology of water areas in relation to their use by waterfowl was begun in Manitoba. Crop depredation problems in the Prairie Provinces continued to receive attention. Detailed studies of the ecology of the eider duck in the southern Baffin Island district were continued in connection with a projected development of the eider-down industry in the Northwest Territories.

Investigations of sea-bird populations along the coast of Newfoundland and Labrador were continued.

Organization of and participation in banding programs were continued during the year. A total of 114,888 birds were banded during 1956. Retriever dogs were used extensively to capture flightless waterfowl for banding. Records of all birds banded in Canada were maintained.

Administration of the Migratory Birds Convention Act was continued in conjunction with the Royal Canadian Mounted Police and in co-operation with the provincial game authorities.

Two new bird sanctuaries were established under the Act. The total number of such sanctuaries is now 90.

Research projects dealing with mammal problems were conducted in the Northwest Territories, the Yukon Territory, and the National Parks. An intensive co-operative caribou research program was organized with the provincial game departments, to commence April 1, 1957. Research and control programs dealing with wolves in the Northwest Territories were intensified. Long-term investigations of fur-bearers, bison, moose, and musk-ox were continued. Big game populations and forage conditions were studied in the national parks.

Two limnologists and a summer assistant surveyed lakes and streams in the national parks and carried out studies on the biology of fish inhabiting park waters. Coarse fish were eliminated, and waters in Banff, Jasper, and Prince Edward Island Parks were reclaimed for restocking with trout. Studies were conducted to evaluate major changes made in the operation of fish hatcheries for faster growth of trout. Assistance was given in a general revision of regulations governing fishing in the national parks.

Water Resources Branch

The Water Resources Branch comprises Administration, Operations, and Hydraulics Divisions and, through its Director or other senior engineers, participates in the activities of the Northern Canada Power Commission and numerous Federal-Provincial and international engineering boards and boards of control.

It conducts the systematic hydrometric survey program throughout Canada, the study and analysis of problems involving federal-provincial and international waterways, the compilation of the power resources inventory of Canada, and the administration of legislation concerning international rivers, water power, and water conservation.

The Branch co-operated with public and private agencies in water-power and water-supply problems, in the maintenance of gauging stations, and in the performance of hydrometric surveys and investigations of mutual concern. Certain gauging stations of international interest are operated in co-operation with the appropriate United States Government agencies. Special investigations were carried out this year in connection with Lake Ontario and with the Columbia, Fraser, Yukon, and St. Lawrence Rivers.

Hydrometric Surveys¹

Hydrometric survey records are published in biennial Water Resources Papers, each covering one of the four main drainage divisions of Canada. Papers covering drainage divisions were issued this year.

A total of 1,183 gauging stations were maintained, and 5,634 stream discharge measurements and 2,292 additional inspections of gauging stations were made by the technical field staff.

The Calgary rating station, maintained for the repair and calibration of stream-gauging apparatus and for experimental work on new instruments, was expanded and improved. Its services were available to other organizations.

Based upon the flow records from 23 typical rivers distributed across Canada, a monthly statement covering stream flow conditions in Canada was released to the public early in each month. The flow records were supplied also to the United States Geological Survey at Washington, which publishes a monthly summary of stream flow throughout North America.

For Canada as a whole, total run-off for the year was moderately above normal, the average for the 23 typical rivers being 129 per cent of their median flow. Well-below-normal flows occurred during late summer and autumn in Nova Scotia, New Brunswick, and on the eastern slopes of the Rocky Mountains and in the early part of the year and during the winter months in parts of Quebec. Elsewhere, river flows were generally near or above normal with consistently high run-off in the prairies and, for the period April to July, in the south-central part of British Columbia. As a result of a high spring run-off in 1956, extreme flooding occurred in the Qu'Appelle River basin; extreme flows also occurred in the Carrot River basin.

¹ See Appendix D on "Details of Stream Gauging", "Run-Off Conditions in Canada", "Snow Surveys", and "Glacier Surveys".

On several rivers subject to dangerous floods, frequent observations of stage were obtained, and a flood warning service was provided during danger periods. Commencing the first of May each year, water levels at 21 key locations in the Columbia and Fraser River basins were made available to the public by the Vancouver district office. From a study of river conditions in the upper reaches together with current meteorological data, a day-by-day computation of probable stages in the lower reaches of these rivers was made available. Co-operation with United States authorities was maintained with respect to determining probable stages on the lower Columbia River. From daily observations at about 16 locations, the Calgary office forecast stages on the North and South Saskatchewan Rivers and transmitted the information to Edmonton, Medicine Hat, Saskatoon, Prince Albert, and to provincial authorities in Alberta, Saskatchewan, and Manitoba; it also participated in the work of the Bow River Ice Committee in alleviating the flood hazard on the Bow River. The Winnipeg office co-operated with local authorities in the Red and Assiniboine Rivers flood forecasts.

For the purposes of estimating the amount of spring run-off, annual surveys of the water content of snow cover were made on typical courses in important drainage basins. Biennial surveys were made of representative glaciers in British Columbia and Alberta; three in Alberta and four in British Columbia were surveyed during the year.

Waterway Problems and Water Power Administration¹

Members of the Branch served on many international and federal-provincial boards whose purpose is to study problems relating to the control of boundary waters. The district offices helped other federal agencies in engineering and administrative activities.

The Branch administered the Dominion Water Power Regulations and inspected and collected rentals on developments made under their authority.

On the basis of the Branch's hydrometric surveys and investigations and other data, revisions are made from time to time to the estimate of the water-power resources of Canada. The current estimate shows resources of 57,007,000 h.p. at ordinary six months flow, which would permit an economic installation of about 74,000,000 h.p. During 1956, new hydraulic installations totalled 845,000 h.p., bringing the installed capacity of all water-power developments in Canada to 18,356,148 h.p. New stations and extensions under active construction for operation in 1957 were tentatively rated at about 1,250,000 h.p.; others with a total capacity of approximately 6,750,000 h.p. were under preliminary construction or were definitely planned.

¹ See Appendix D on "Boards on Which Water Resources Branch Has Membership", "Developments Under Dominion Water Power Regulations", and "Technical Assistance to Federal Agencies."

Forestry Branch

The Forestry Branch carried out programs of research directed toward the improvement of forest management and the utilization of forest products. It is responsible for the administration of agreements with the provinces through which federal financial assistance is extended with respect to certain forestry activities carried on by provincial departments. For a number of years the Branch has conducted forest inventory surveys in the Northwest and Yukon Territories. During the year under review, plans have been developed for the Branch to accelerate its survey program and to provide technical advice to other branches of the Department charged with administration of forests. Plans for extending similar services to other departments of government are under consideration.

The Forestry Branch is organized in three divisions, namely, Forest Research Division, Forest Products Laboratories Division, and Forestry Operations Division. In addition, there are separate sections dealing respectively with Forest Economics and Branch Administration.

Construction of a new forest research laboratory at the Petawawa Forest Experiment Station was virtually completed during the year. Construction of new forest products laboratories at Ottawa and Vancouver, and of a new laboratory at Pointe Claire, Quebec, was commenced, the latter to be operated by the Pulp and Paper Research Institute of Canada.

*Forest Economics*¹

Research on problems concerning the development of Canada's forests and their relation to the forest economy of the North American continent was carried on as well as studies of the economic implications of forestry legislation. Basic data on Canadian forest resources were compiled and analyses made of statistics relating to production, consumption, and trade in forest products. Economic and statistical reports were prepared for international organizations, such as the Food and Agriculture Organization (FAO) and the British Commonwealth Forestry Conferences.

The Chief of the Section continued to act as co-ordinator of the Forestry Study Group of the Royal Commission on Canada's Economic Prospects, and statistical services were provided for this work. Representation was provided on the Interdepartmental Food and Agriculture Organization Committee.

Forest Industries

The forest industries maintained a high level of production throughout the year, though there was a slight decrease in the value of forest products exported. This decrease, which amounted to approximately \$6 million (or less than 1 per cent of the total) resulted mainly from reduced lumber production. The quantity of lumber exported was 14 per cent below that of the previous year. However, exports of wood pulp and newsprint increased to a level where they partially offset this decline. The value of exports of forest products represented about 32 per cent of the total value of Canada's export trade.

¹ See Appendix E, Nos. 1 to 3.

The pulp and paper industry in 1956 produced a record of 10.7 million tons of wood pulp, out of which an estimated 6.5 million tons of newsprint were produced, representing a 4 per cent increase over the previous year. An estimated 7,770 million board feet of lumber were also produced. This represents a 3 per cent decrease in production from the previous year.

During 1955 the utilization of forest products amounted to 3,325 million cubic feet, an increase of 5 per cent over the 1954 utilization figure and an 8 per cent increase over the average utilization for the 10-year period 1945 to 1954.

The net value of production of the forest industries in 1954 was estimated to be \$1,998 million or 14 per cent of the total net value of production of all Canadian industries, compared to a figure of only 11 per cent for 1938.

Forest Research Division¹

Research activities included fact-finding surveys to evaluate existing conditions, fundamental studies concerning the characteristics and behaviour of forest species and the influence of different factors of their environment, and applied research to develop practical methods for influencing forest development and improving operating and research techniques.

Within the Forest Research Division there are three Sections concerned respectively with silviculture and management, forest inventories, and forest fire protection; and five district offices located at Calgary, Alta.; Winnipeg, Man.; Valcartier, Que.; Fredericton, N.B.; and St. John's, Nfld.; and the Ontario Research Unit at Ottawa.

Silviculture and Management Research

Silviculture deals with the theory and practice of controlling forest establishment, composition, and growth, while forest management is concerned with the application of business and technical principles to the operation of forest properties in order to achieve continuous production, with the net growth and harvest in approximate balance.

The principal tasks within this field of forest research are as follows:

- 1.. Development of a satisfactory system for classifying forests and forest sites as a basis for proper silviculture and management. This includes a study of physiographic and edaphic features, lesser vegetation, and the forest itself.
- 2.. Determination of the silvical characteristics of Canadian tree species and the ecological relationships of the associations in which they occur. Included are fundamental studies of plant growth as related to such factors as temperature, light, moisture, frost, and studies of succession, all of which determine the character of the forest.
- 3.. Development of methods of silviculture applicable to the more important forest types and to Canadian economic conditions. Studies are concerned with economic and practical harvesting methods for existing forests and experimentation to ensure future forests of desirable species.
- 4.. Development and testing of practical methods for the actual and potential growth and yield of forests. An assessment of the potential productivity of forest sites and an accurate prediction of future yields of forests are essential for long-term management.

¹ See Appendix E, Nos. 4 and 5.

5. Development of improved techniques for reforestation and of improved strains of tree species suitable to Canadian conditions. Included are studies for the improvement of planting, seeding, and nursery techniques, and the development through selection and hybridization of better trees for use in reforestation programs.
6. Improvement of methods of organizing forest data into plans of regulation and silviculture for forest areas suitable to different intensities of management. This provides not only technical information for the implementation of management, but also valuable demonstration of various intensities of management in commercially important forest types.
7. Improvement of research methods, mensuration techniques, and the design of experiments. Experimental designs are developed to ensure the validity of results, mathematical functions of growth developed, and mensurational techniques tested and improved.

In all districts, studies of forest and forest site classification were in progress to provide the basic framework within which both research and forest management must be conducted. Fundamental ecological studies, tree breeding, provenance studies, and research in tree physiology continued, with the major part of this work being done at the Petawawa Forest Experiment Station, Chalk River, Ontario.

Tests of silvicultural techniques, with emphasis on regeneration following cutting and fire, continued in all districts; basic data were obtained as a preliminary to the management of selected and representative forests in each district, and data collected as a basis for the preparation of yield tables for important species. Studies of different cutting practices were expanded to include additional important forest types. Requests continued from forest industries and provincial agencies for technical assistance in planning such applied experimentation.

Forest Inventories Research

Tables are being compiled to aid the interpreter in making estimates of timber volumes from air photographs. Tests are being conducted in the forestry use of various air cameras and films. Improvements in equipment are being made. Research in various field-sampling methods is being continued.

Provisional forest maps covering 19,580 square miles in the Territories and Wood Buffalo National Park were prepared from air photographs. Work was continued on the revision of provisional maps and the preparation of timber estimates by the aid of field data, including those of 578 sample plots measured in 1956.

A forest map of the Peigan Indian Reserve, Province of Alberta, comprising 11 square miles, was prepared.

Fire Protection Research

Many of the major problems in forest fire research are related to the measurement of fire danger and fire control planning. Most investigations are made at the request of provincial and other forest protection agencies which often co-operate in the undertakings. All members of the staff of the Section are in Ottawa, though most of the technical officers spend the fire season in the field at forest experiment stations or at temporary fire research stations.

New simplified forest fire danger tables for Newfoundland, New Brunswick, Ontario, Manitoba, and the East Slope of the Rocky Mountains were published. The basic field studies required for similar tables for Saskatchewan and Alberta were completed. Arrangements were made to establish two temporary fire research stations in British Columbia. Other investigations included experiments with power pumps and forestry hose, soil sterilizers, and the observation of control-burn experiments.

Forestry Operations Division

This Division administered agreements between the Federal and Provincial Governments under the Canada Forestry Act and an agreement to provide financial assistance to the Province of New Brunswick for spraying operations against the spruce budworm. Small education and park units were maintained. Forest fire protection and forest management were provided at Camp Gagetown, N.B., under an arrangement with the Department of National Defence.

Provincial Agreements¹

*Forest Inventories*²

New agreements under the Canada Forestry Act were executed with all provinces which had previously participated under the first agreements of 1951. These agreements provide for the completion of initial forest inventories by March 31, 1958, and for assisting the provinces for a 5-year period ending March 31, 1961, in keeping the inventories up to date. The Federal Government pays half the cost of these programs and continues to assist the provinces in reforestation.

The initial inventories for Alberta, Saskatchewan, Manitoba, and Nova Scotia were completed or virtually so. Maintenance of these inventories is becoming an increasingly important phase of the work.

Progress on initial inventories in British Columbia, Ontario, and New Brunswick was satisfactory. Inventory programs for these provinces provide for the completion of the inventories by March 31, 1958. On the average, inventory work under the agreements is now about 90 per cent finished.

*Reforestation*³

Under the renewed agreements, provinces that maintain their annual reforestation programs on unoccupied Crown lands at or above the average of the past three years are entitled to a federal contribution of \$10 per thousand trees planted and \$1 per acre seeded. The Federal Government is also paying one-fifth the cost of establishing and operating new forest nurseries.

Under a special agreement, Prince Edward Island receives 50 per cent of the cost of the reforestation of waste lands unsuited to agriculture.

¹ See Appendix E, No. 8.

² See Appendix E, No. 6.

³ See Appendix E, No. 7.

During 1956-57, work on new nurseries was continued in Prince Edward Island, Ontario, and Manitoba. Saskatchewan, Manitoba, Ontario, Nova Scotia, and Prince Edward Island planted 13,382,000 trees. Saskatchewan seeded an area of 255 acres.

Since the beginning of the agreements in 1951, 72,657,000 trees have been planted, 7,006 acres seeded, and 10 new nurseries established.

Forest Fire Protection

The Minister of Northern Affairs and National Resources announced that the Federal Government had offered to broaden the implementation of the Canada Forestry Act by providing financial assistance to the provinces for forest fire protection. A total of \$5 million is to be made available for this purpose during the next five years. Federal contributions will be applicable to capital expenditures, such as the cost of fire protection equipment and improvements, and of forest access roads, trails, and buildings required for forest fire protection.

Aerial Spraying Operation — New Brunswick¹

Under the agreement with the Province of New Brunswick for combating the spruce budworm by aerial spraying, the Federal Government announced that the maximum federal contribution of \$3,000,000 for expenditures during the period from September 13, 1952, to March 31, 1959, would be increased to \$3,250,000 in view of the continued severe infestation of the budworm which seriously threatens the wood supply of the forest industries in northern New Brunswick. The Provincial Government and the forest industries in the area affected are each contributing a like amount.

Spraying operations in 1956 were again conducted by Forest Protection Limited, a Crown corporation organized for the purpose. Using eleven airfields constructed for the program, about 1,024,000 gallons of DDT insecticide were sprayed from 90 aircraft over approximately 1,974,000 acres of forests. The net area now sprayed under the agreement is approximately 5,100,000 acres, of which some 950,000 acres have received more than one application of insecticide.

Following the 1956 spray operation, studies by forest entomologists of the federal Department of Agriculture again showed no evidence of a decline in the outbreak because of natural control factors. Plans have therefore been made for spraying an area of about 5,000,000 acres in 1957. Much of this area was sprayed previously. Two new airfields were constructed, making a total of 14 available for this purpose.

Camp Gagetown, N.B.²

By arrangement with the Department of National Defence, the Branch is responsible for forest fire protection and forest management on the 430-square-mile Camp Gagetown military area in New Brunswick.

The construction of the forestry headquarters, consisting of five buildings near Oromocto, was completed. Construction began on three ranger headquarters in other districts.

¹ See Appendix E, No. 9.

² See Appendix E, No. 10.

Very favourable weather conditions and an almost complete cessation in clearing forest areas for military purposes greatly reduced the number of forest fires. Nine fires, which occurred within the boundaries of the camp area, burned seven acres of forest and about six acres of non-forested land. In addition, two fires on adjoining property required the attention of Forestry Branch crews. Timber valued at \$107 was destroyed, and the cost of fire suppression was \$553.

Dues received from the sale of sawlogs, poles, and fuelwood, together with hay and grazing dues, again showed a substantial increase.

Other Military Areas

The Forestry Branch supervised a small timber sale at Camp Borden, Ontario, where the disposal of pulpwood from thinnings of pine plantations is being carried out under contract. At Camp Utopia in New Brunswick, a contract was arranged for the taking of a forest inventory of the forest lands in this area.

Education¹

The distribution of forestry literature amounted to 57,151 pieces. A revised French edition of *Forestry Lessons* is in course of preparation. The fifth edition of *Native Trees of Canada* was issued by the Queen's Printer.

Through the co-operation of the Post Office Department, forest fire prevention posters were again displayed in post offices throughout Canada, and mail at several large cities was cancelled with special dies at the start of the forest-fire danger season.

Requests for information on forestry topics resulted from the window displays maintained at the Forestry Branch Head Office, Ottawa. More than 261 black-and-white prints and 125 colour slides were added to the photographic library; a number of photographs were supplied to outside organizations for use in publications.

National Parks

Technical advice and assistance in the management of forests in the western National Parks were provided by a forester stationed at Jasper.

Forest fire protection plans for Jasper and Prince Albert Parks were revised. Tree planting was carried out at Banff, Jasper, and Riding Mountain Parks. In Jasper Park, cutting operations were supervised, and a timber cruise was made in Glacier Park. Co-operation in forest insect and disease surveys was maintained with the Forest Biology Division, Canada Department of Agriculture.

Forest Products Laboratories Division²

Research carried out at the Ottawa and Vancouver Laboratories followed the carefully planned long-term program which provides for continuance of projects to determine the mechanical, physical, and chemical properties of wood. Thus, research was active in the fields of timber engineering, plywood and adhesives, wood preservation, timber pathology, wood chemistry, logging and milling, lumber seasoning, and wood anatomy.

¹ See Appendix G.

² See Appendix E, No. 11, and Appendix G.

At the Ottawa Laboratory, research also included utilization of wood residues by microbiological techniques, the uses of wood and wood-based products for containers, the fundamentals of veneer cutting and of the sawing of lumber, bark removal, and processing of sawmill residues, and the painting of wood.

It is increasingly evident that all work in the fields of lamination, structural forms, the use of adhesives, the cutting of veneers, and manufacture of plywoods is of growing industrial interest. Similarly, a vast amount of research work and investigation has been carried out to satisfy demand for information on the processing of residues—particularly those occurring in sawmilling—to raw material for pulp and wallboard manufacture. This work not only fits into the changing economic pattern in the wood-using industries but also aims at more thorough utilization of the annual forest harvest and is therefore a most worthwhile method of forest conservation.

A more detailed outline of the specific work under main research projects and for each Laboratory will be found in Appendix E 11.

Special investigations on the properties of new products and on engineering, bending, gluing, and container design problems, were undertaken for Central Mortgage and Housing Corporation, for government departments, especially National Defence and Agriculture, and for various forest products industries.

In order to determine the effectiveness of various processes, methods, and techniques, and to assess the possibility of improvements beneficial to utilization, numerous field investigations on the harvesting of timber and its manufacture into various products were carried out.

To give effective and widespread distribution of research results, special attention was given to the preparation of publications dealing with various phases of research. A large number of articles were also prepared for scientific and trade journals, and papers were delivered by members of the staff at meetings of professional societies and trade associations. More than 17,000 publications were distributed, mostly in answer to requests. New F.P.L. publications are listed in Appendix G.

Exhibits illustrating the properties of wood and portraying the results of research were prepared for meetings in Ottawa, Toronto, Montreal, Chicoutimi, and Rouyn. In addition, 3,816 samples of Canadian timber species were sold to the general public. Co-operation was given the Canadian Exhibition Commission in the preparation of the forestry exhibit for the 1958 Brussels World Fair.

Inquiries for technical information totalled 2,572 and came from Canadian industry and the general public.

Staff members acted as chairmen or participated as members on committees concerned with the National Building Code, the Canadian Standards Association, the Canadian Government Specification Board, the American Association for Testing Materials, the Food and Agriculture Organization of the United Nations, and various technical committees on lumber, plywood, furniture, and pulp and paper.

An advisory committee at each Laboratory, with members drawn from various timber-producing and wood-using groups, continued to assess periodically the research work carried out in relation to industrial needs and thus to provide a close link with industry generally. This

type of forum permits an exchange of views, discussion of trends, review of present and probable technological advances, and through discussions serves to clarify the needs of the national economy, of industry, and of the consumer.

On an international basis, constant liaison with governmental and private wood products research institutions in other lands was maintained, so that through an awareness of progress made elsewhere and through the exchange of research data, Canadian interests may be better served and duplication of research effort avoided. The importance of this liaison was partly reflected through publication in other countries of several reports and articles emanating from the Division.

The Superintendent, Ottawa Laboratory, was a member of the FAO/UN—ECE working party in Geneva for six months, who were preparing background papers for use at the FAO International Conference on Fibreboards. He subsequently attended as Canadian Government representative. The Chief of the Division was the Canadian Government member on a delegation of Canadian lumbermen which visited the USSR in July and August.

National Museum of Canada—Natural History Branch

This Branch deals with the rocks, minerals, fossils, plants, and animals of Canada. It is responsible for the collection, preservation, study, and display of material illustrating the geological and biological sciences.

During the year under review, eleven field parties carried out studies from Nova Scotia to British Columbia. Large additions to the collections were made as a result of field work, and by gift and purchase. Reports on a number of studies by Museum staff members have been published, as listed in Appendix G. Some new exhibits were installed, and a program of temporary exhibits in the Museum rotunda was begun with a display of geophysical apparatus to direct attention to the International Geophysical Year. Preliminary studies were made on the organization to be used when additional space becomes available.

Botany

Botanical investigations were conducted in Alberta, Manitoba, Ontario, Quebec, and New Brunswick. Photographs and recorded notes supplied much valuable information concerning the mosses, ferns, and flowering plants of the districts visited, and large collections of specimens were made for the National Herbarium as well as for exchanges with other botanical institutions.

The specimens resulting from field work were studied and classified in the herbarium, as were other collections submitted for determination and report by government departments, by other herbaria, by the botanical departments of Canadian or foreign universities, or by individuals. Eight botanical papers and six reviews were published; two book-length manuals on the flora of Canada and five shorter papers are in press awaiting publication; book-length reports on the flora of the Canadian Rocky Mountains and of the Clay Belt of northern Ontario and northern Quebec as well as other papers on Canadian flora are in process of preparation. Work was also started on a flora of the Canadian Atlantic Seaboard. Nineteen maps illustrating plant distribution were prepared for the *Atlas of Canada*. A report on botanical exploration in Canada since 1900 was prepared for the American Journal of Botany. Four lectures on botanical subjects were given by staff members, who also took part in one radio and one television broadcast.

During the year 7,071 herbarium specimens were received by exchange, 2,919 by donation, and approximately 19,987 resulted from field work or were obtained in exchange for determination. Specimens numbering 2,503 were sent on loan to other botanical institutions, and 3,210 were borrowed from them. Duplicate specimens, 3,843 in number, resulting from field work of the staff, were distributed to Canadian and foreign herbaria in continuation of exchange. Specimens of vascular plants numbering 8,438 and of cryptogams numbering 8,385 were mounted and inserted, bringing the total number of specimens in the National Collection to 313,861. Thirty-five type specimens were collated and indexed, bringing the total number of indexed types of vascular plants in the herbarium to 1,737. Some 200 Canadian or foreign botanists visited the herbarium during the year.

Zoology

Field investigations were conducted on the distribution and ecology of intertidal and shallow-water marine invertebrates, together with incidental studies of freshwater invertebrates in western Nova Scotia. The amphibians of the Annapolis Valley, Nova Scotia, were studied, and herpetological field studies were also conducted in Ontario near Smiths Falls and Long Point, and in Quebec in the Montreal region. Field studies of birds and the extent of certain natural biotic areas were carried out in the Prairie Provinces and British Columbia. Field investigations were made of the mammals of southeastern New Brunswick and the Chignecto area of Nova Scotia. Good collections of mammals and birds were made in the Tweedsmuir Park area of British Columbia. Habitat studies of birds and mammals were conducted in the Churchill area of Manitoba.

Laboratory work was continued on a world-scope revision of the amphipod family Talitridae. Studies were well advanced on the genus *Gammarus* on the eastern coast of North America, as was another study of the freshwater amphipods of Canada and glaciated northeastern United States. The preparation of a popular booklet on *The Sea Shells of Eastern Canada* was brought well on toward completion. Reports were completed on a study of the amphipod genus *Orchestoidea* with a description of a new species from the Pacific Coast of North America; on duck-pond culturing of amphipod crustaceans in Ontario; and on an investigation of the ecology and distribution of invertebrates in the Vancouver Island region. Studies were begun on glacial refugia and post-glacial dispersal routes with reference to their significance in taxonomic research on North American organisms; on taxonomic relationships of the forms of the turtle genus *Chrysemys*; and on the identification of the turtle bone fragments found in prehistoric Indian villages of Ontario and Quebec with a view to interpreting the relationships of the various turtle species to the village organization. A report on a zoogeographical study on reptiles and amphibians of eastern Canada was brought to completion. Work was begun on *The Birds of Canada*, a book in which all bird species known to have occurred in Canada will be treated. The following manuscripts were completed: A report on the birds of Cape Breton Island, Nova Scotia; an ecological treatment of the distribution of the warblers in the Canadian Prairie Provinces; a comprehensive comparative study of the mammals on the islands of Newfoundland, Anticosti, Magdalen, Prince Edward, and Cape Breton; new mammal records for Prince Edward Island; a specimen record in New Brunswick of the shrew *Sorex arcticus*; and a popular illustrated booklet *Canadian Mammals*.

Routine identification and curator work were continued on all the research collections. The following numbers of specimens were accessioned during the fiscal year: 1,130 mammals; 880 birds; 341 reptiles and amphibians; and 304 lots of invertebrates. At the end of the fiscal year the research collections contained 23,400 mammals; 41,797 birds; 10,060 reptiles and amphibians; 2,000 fishes; and 148,800 invertebrates.

Palæontology

A field party in search of fossil mammals operated in Miocene localities in southern Saskatchewan and in Eocene localities in southeastern British Columbia. Another expedition worked in the Upper Cretaceous of Alberta and spent most of the season excavating the skeleton of a duck-billed

dinosaur in the Red Deer River badlands north of Drumheller. Studies were completed on a Cretaceous dinosaur from Alabama (in co-operation with the Chicago Natural History Museum), fossil mammals from Alberta, and fossil molluscs from British Columbia. In the laboratory, a number of specimens were prepared for study, but emphasis was placed on the preparation of specimens to be used in future exhibits. The most important of these is the skeleton of a large flesh-eating dinosaur. The arrangement and contents of the future hall of palæontology were planned. The study collection of fossil vertebrates was renovated.

As a result of collecting, donation, and purchase, 230 specimens were added to the collection of fossil vertebrates.

Educational Services¹

¹ See Appendix F.

National Museum of Canada—Human History Branch

The Ethnological and Archæological Sections of the National Museum constitute the nucleus of the new Human History Branch. Everything pertaining to human sciences, which at one time or another were a part of the activity of the National Museum, falls in the realm of the Human History Branch. The activity of the Branch might be divided into two different fields: Education and Research.

The educational program¹ of the Human History Branch is done in co-operation with the Natural History Branch.

In addition to the regular program, two temporary exhibits were displayed this year in the rotunda of the National Museum. The first, *The origin of Amerindian Agriculture*, was a small exhibit on the origin of agriculture based on research. The second, *An Eskimo Exhibit*, covered the activity of the Eskimo from prehistoric times to modern times. The central exhibit was an Eskimo winter igloo built in styrofoam. This exhibit brought 19,631 visitors to the Museum.

The research program is described in the two following sections:

Division of Archæology

Reconnaissance was undertaken in the Ottawa River Valley as well as in the central section of the St. Lawrence River drainage.

Archæological investigations were made on a fortified site near Corunna, Ontario. A joint archæological project with the Department of Anthropology of the University of Toronto was initiated in a sector of the St. Lawrence Seaway area. This was an attempt to salvage the archæological materials from the important sites that will be destroyed by construction.

Sadlermiut houses were excavated and mapped at Native Point, Southampton Island, N.W.T. This was the completion of a joint endeavour formerly conducted in conjunction with the Smithsonian Institution of Washington, D.C. Further survey for Dorset remains was conducted in surrounding areas.

Extensive digging on a stratified site on the east bank of the Firth River in the northern part of Yukon Territory was continued. During the latter part of the season the recent geology was studied by members of the University of British Columbia on a grant from the Arctic Institute.

A brief survey was conducted in the region of Flin Flon, Saskatchewan, at the request of local inhabitants who were interested in the establishment of a museum and the reconstruction of an early fort or trading post.

Early archæological remains of domesticated plants from Mexico and Canada were studied in co-operation with scientists of a number of other institutions. Early corn remains, as well as Iroquois corn, were analysed by staff members in conjunction with scientists from the Botanical

¹ See Appendix F.

Museum of Harvard University. An attempt was made to discover and interpret the domestication, evolution, and dispersal of beans in the pre-historic New World by a member of the staff in co-operation with scientists from the Missouri Botanical Gardens and the University of Chicago. The earliest pumpkin and gourd remains so far found in the world, as well as later squash and pumpkin developments, were analysed with a member of the staff of the United States Department of Agriculture, and a paper was published on this subject. Other ancient domesticated plant remains were studied in co-operation with members of the staff of Macdonald College (Ste. Anne de Bellevue, Quebec) and of the University of Montreal.

The study of Naskapi ethnobotany, started by the Director when at the Montreal Botanical Gardens, was continued.

Division of Ethnology

Investigations in Social Anthropology were carried on in New Brunswick, especially among Acadians of various parts of this province. A lengthy questionnaire was presented to some 300 teachers spending part of the summer at St. Joseph's University in New Brunswick.

A brief survey into the state of the acculturation of the Ojibwa Indians was conducted in the Timagami district.

Folkloric investigations were continued in the Gaspé Peninsula in order to complete a previous survey.

In Nova Scotia, numerous recordings were made on various topics of oral traditions.

A study of the vernacular names of plants in Quebec was continued.

1956 Annual Report

Canadian Government

Travel Bureau

The Canadian Government Travel Bureau, established in 1934, is the federal agency responsible for the promotion of travel to and within Canada, and for the general welfare of Canada's tourist industry.

The staff of 85 to 90 persons is located in new quarters covering the entire second floor of the Kent Building in downtown Ottawa. There are also offices of the Bureau in New York and Chicago with small information staffs, as well as a travel representative at the Canadian Consulate General in Los Angeles.

The Eleventh Federal-Provincial Tourist Conference was held at Ottawa on November 26 and 27, with delegates from federal departments, provincial tourist organizations, and the leading transportation companies. The conference took a long searching look at the 1956 travel year and concluded that, although unseasonable weather, exchange problems, and other factors contributed to mild declines in tourist volume in certain parts of Canada, there remained the basic need for a more vigorous promotion of Canadian travel attractions for visitors from other countries as well as for Canadians themselves. In the interests of domestic travel, the "Know Canada Better" program is being continued on an expanding scale.

It was announced to the Conference that the advertising budget of the Canadian Government Travel Bureau, which for the past several years had approached a million dollars annually, would be increased by approximately one-third. This major advertising increase in 1957 is being devoted largely to a zonal campaign on behalf of travel to the Atlantic Provinces.

Canada's tourist industry set new records in 1956, with travel receipts from the United States rising to \$308 million, an increase of \$5 million over the previous year. Receipts from other countries rose to a new high of \$27 million, an increase of \$2 million. Canadians spent \$391 million on travel in the United States and \$106 million in other countries. There were 27,666,500 individual entries into Canada in 1956, and an estimated 8½ million persons came to Canada as long-stay automobile entries, though not all remained for 48 hours or longer. During the April-October period, attendance at the National Parks of Canada was 3,507,440, a net increase at all parks of 114,208 over the same period of 1955.

In 1956, the Bureau achieved a new all-time record for inquiries handled during a single year. A total of 538,063 inquiries were received, 460,882 by its Ottawa office, 55,181 by the New York office, and 22,000 by the Chicago office. An advertising program at a cost of \$974,607 was conducted in 50 magazines and 59 newspapers in the United States. Combined circulation of the magazines used totalled 71,909,759.

The Bureau's principal publication, *Canada—Vacations Unlimited*, was redesigned to contain a greater number of full-page colour pictures. It is now slightly larger than its predecessor and is printed on linen stock.

The maple leaf design on the cover has been retained. An initial order for half a million copies was printed in 1956. The new booklets for Prince Albert and Riding Mountain National Parks were enlarged to include more detailed fishing information, and ten new colour posters were added to the Bureau's stock. Of the 79 publications produced by the Bureau, 15 of the information type were multilithed. Mailing lists of more than 4,000 names were utilized in the promotion and distribution of literature to United States outlets. The year's distribution of publications prepared by the Bureau amounted to 4,703,960 pieces of literature, mostly to the United States.

During 1956, editorial publicity was expanded, and the distribution of black-and-white photographs amounting to 8,857 brought the Bureau's five-year total of photos mailed to 37,492. The special vacation sections of 82 United States newspapers were serviced with a total of 502 black-and-white photographs.

On behalf of the Canadian Government Travel Bureau, Canada-wide photographic schedules were carried out in the summer of 1956 by National Film Board photographers. More good travel photographs in both black-and-white and colour were obtained than in any other single year. More than half of the photos were National Parks of Canada still pictures. In the 1956 summer schedule of photography, 567 colour subjects and 213 black-and-white negatives were added to the Bureau's photo library.

The domestic mat service on National Parks subjects begun in 1955 was continued in 1956 with two new pictorial folders sent to weekly editors in Canada, one in April and one in July.

The impact of television in the United States has greatly increased the number of viewers of Canadian travel films. During 1956, through the operation of the Canadian Government Travel Bureau's free Television Library, an estimated 1,524 telecasts of 34 titles were seen by 67 million people. A special print of each subject was made available for colour telecasts; these were used on 140 occasions.

A major expansion in the number of film libraries across the United States increased the number of these outlets to 379. Print deposits were again increased to place 5,282 in free circulation in the United States. In spite of increasing competition from television, these prints, through 68,401 showings to audiences totalling 4,136,627, registered a gain of 6 per cent.

APPENDICES

APPENDIX A

Summary of Revenues and Expenditures, 1956-57

	<i>Revenues</i>	<i>Expenditures</i>
ADMINISTRATION OFFICES	\$ 128 22	\$ 599,697 82
NORTHERN RESEARCH CO-ORDINATION CENTRE ..		66,163 83
NATIONAL PARKS BRANCH		
Branch Administration	—	93,340 20
National Parks and Historic Sites	1,485,843 67	15,283,019 47
Grant to Jack Miner Migratory Bird Foundation	—	5,000 00
Grant in aid of the development of the International Peace Garden in Manitoba	—	9,972 64
North Battlefields Commission	—	156,318 05
Canadian Wildlife Service	2,226 72	469,245 04
National Museum	3,012 55	349,368 85
	1,491,082 94	16,366,264 25
WATER RESOURCES BRANCH	130,748 42	1,815,905 60
NORTHERN ADMINISTRATION AND LANDS BRANCH		
Branch Administration	235,420 17	961,301 88
Yukon Territory	323,650 41	2,192,511 35
Northwest Territories	1,205,273 16	8,943,406 72
	1,864,343 74	12,097,219 95
FORESTRY BRANCH		
Branch Administration	—	145,293 67
Forest Research Division	28,722 34	1,233,086 24
Forestry Operations Division	38,633 20	1,912,705 06
Forest Products Laboratories Division...	3,629 24	1,172,573 15
Grant to Canadian Forestry Association	—	10,000 00
Eastern Rockies Forest Conservation Board	—	5,042 77
	70,984 78	4,478,700 89
CANDIAN GOVERNMENT TRAVEL BUREAU	2,598 00	1,546,282 94
TOTALS FOR DEPARTMENT	\$ 3,559,886 10	\$36,970,235 28

APPENDIX B

1. Mineral Production

	1955		1956 ¹		Cumulative Total To Year Ended Dec. 31, 1956
	Quantity	Value	Quantity	Value	
NORTHWEST TERRITORIES					
		\$		\$	\$
Gold.....	321,321 oz.	11,092,001	352,645 oz.	12,145,094	95,008,017
Silver.....	58,477 oz.	51,565	69,867 oz.	62,678	1,323,914
Lead.....	—	—	—	—	4,933
Copper.....	—	—	—	—	26,607
Pitchblende.....	(unavailable)	13,248,198	(unavailable)	9,394,000	243,933,778
Crude Petroleum.....	404,219 bbl.	1,185,780	457,000 bbl.	1,340,000	7,608,110
Natural Gas.....	18,670 M cu.ft.	6,213	21,000 M cu.ft.	7,350	88,717
Tantalum (Ta ₂ O ₅)....	390 lb.	9,760	—	—	12,456
Tungsten.....	—	—	—	—	53,146
Columbium (Cb ₂ O ₆)..	42 lb.	1,032	—	—	3,326
TOTAL.....	—	25,594,549	—	22,949,122	148,063,004

YUKON TERRITORY

		\$		\$	\$
Gold.....	72,201 oz.	2,492,379	73,240 oz.	2,522,386	242,745,071
Silver.....	5,712,219 oz.	5,037,035	6,170,700 oz.	5,535,735	54,918,376
Lead.....	26,248,786 lb.	3,774,775	25,779,000 lb.	3,998,323	29,722,101
Copper.....	—	—	—	—	2,711,695
Coal.....	7,040 tons	81,806	9,623 tons	113,660	1,667,307
Tungsten.....	—	—	—	—	25,888
Zinc.....	21,823,307 lb.	2,978,881	20,788,000 lb.	3,078,703	15,083,453
Antimony.....	—	—	—	—	173
Cadmium.....	211,808 lb.	360,074	253,000 lb.	430,100	2,345,306
TOTAL.....	—	14,724,950	—	15,678,907	349,219,370

¹ Preliminary estimate.² Figures for the years 1932, 1942 to 1953 inclusive not available.

2. Oil and Gas Permits, Leases, and Reservations

YUKON AND NORTHWEST TERRITORIES

	Number	Acreage
<i>Northwest Territories—</i>		
Active Oil and Gas Permits.....	192	10,249,001
Oil and Gas Leases.....	10	81,990
Surface Leases.....	2	892.2
<i>Yukon—</i>		
Active Oil and Gas Permits.....	32	1,589,167
Oil and Gas Reservations (N.W.T. and Yukon).....	2	6,133,760

PROVINCIAL OIL AND GAS LEASES

Manitoba.....	91	14,560
Saskatchewan.....	138	22,080
Alberta.....	133	32,800
TOTAL.....	362	69,440

3. Land Sales and Privileges, Hay and Timber Permits

	Yukon	Northwest Territories
LANDS SALES—		
Completed.....	54	44
New agreements of sale.....	15 (a)	26 (b)
Agreements of sale in force.....	128 (c)	61 (d)
(a) Includes 6 agreements for veterans.		
(b) Includes 13 agreements for veterans.		
(c) Includes 108 agreements for veterans.		
(d) Includes 44 agreements for veterans.		
LAND PRIVILEGES—		
New leases executed during year.....	25	59
Cancellations during year.....	37	38
Leases in force:		
Agricultural.....	7	10
Fur farm.....	1	5
Grazing.....	7 (a)	4 (b)
Surface.....	132 (c)	142 (d)
Waterfront.....	18	47
Licences of occupation.....	3	7
Permissions to occupy.....	7	12
TOTAL LEASES IN FORCE.....	175	227
(a) 83 horses and 10 head of cattle maintained.		
(b) 7 horses and 6 head of cattle maintained.		
(c) Includes 2 leases for veterans.		
(d) Includes 11 leases for veterans.		

HAY PERMITS—		
Number of permits issued.....	2 (a)	—
(a) 8 tons of hay cut		

TIMBER PERMITS—		
Commercial permits.....	49	20
Other permits:		
Permits free of fees and dues.....	21	9
Permits free of dues.....	17	14
Permits dues paid.....	179	103
TOTAL TIMBER PERMITS.....	266	146

4. Volume of Timber Cut

	Yukon Territory			Northwest Territories (including Wood Buffalo Park)		
	Lumber	Round Timber	Fuel-wood	Lumber	Round Timber	Fuel-wood
	(ft.b.m.)	(lin. ft.)	(cords)	(ft.b.m.)	(lin. ft.)	(cords)
Commercial permits.....	4,865,743	1,936,034	1,940	21,117,364	850,064	119
Other permits:						
Permits free of fees and dues	—	4,300	650	—	48,000	435
Permits free of dues.....	—	—	905	10,000	900	1,095
Permits—dues paid.....	27,000	219,357	4,253	—	69,622	4,059
TOTAL CUT.....	4,892,743	2,159,691	7,748	21,127,364	968,586	5,708

5. Revenue

	N.W.T.		Yukon		Provinces		Total	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.
Mining.....	316,699	00	167,831	00	22,578	00	507,108	00
Oil and gas.....	580,373	33	62,687	72	299,446	92	942,507	97
Lands, timber, and grazing.....	157,782	40	63,381	06	55,766	36	276,929	82
TOTAL.....	1,054,854	73	293,899	78	377,791	28	1,726,545	79

6. Seed Grain, Fodder, and Relief Advances

SUMMARY

	Principal		Interest		Total	
	\$	cts.	\$	cts.	\$	cts.
<i>Debits—</i>						
Amount outstanding, March 31, 1956.....	645,610	79	1,255,345	78	1,900,956	57
Accrued interest April 1, 1956, to March 31, 1957	—		28,815	14	28,815	14
TOTAL DEBITS.....	645,610	79	1,284,160	92	1,929,771	71
<i>Credits—</i>						
Net revenue April 1, 1956, to March 31, 1957...	36,076	64	3,668	93	39,745	57
Amount written off as loss by Orders-in-Council —April 1, 1956, to March 31, 1957.....	161,023	15	395,296	01	556,319	16
TOTAL CREDITS.....	197,099	79	398,964	94	596,064	73
Amount outstanding March 31, 1957.....	448,511	00	885,195	98	1,333,706	98

ALBERTA

<i>Debits—</i>						
Amount outstanding March 31, 1956.....	157,137	18	290,581	40	447,718	58
Accrued interest April 1, 1956, to March 31, 1957	—		7,505	80	7,505	80
TOTAL DEBITS.....	157,137	18	298,087	20	455,224	38
<i>Credits—</i>						
Net revenue April 1, 1956, to March 31, 1957...	13,971	33	1,745	09	15,716	42
Amount written off as loss by Orders-in-Council —April 1, 1956, to March 31, 1957.....	32,645	88	92,425	42	125,071	30
TOTAL CREDITS.....	46,617	21	94,170	51	140,787	72
Amount outstanding March 31, 1957.....	110,519	97	203,916	69	314,436	66

SASKATCHEWAN

<i>Debits—</i>						
Amount outstanding March 31, 1956.....	488,473	61	964,764	38	1,453,237	99
Accrued interest April 1, 1956, to March 31, 1957	—		21,309	34	21,309	34
TOTAL DEBITS.....	488,473	61	986,073	72	1,474,547	33
<i>Credits—</i>						
Net revenue April 1, 1956, to March 31, 1957...	22,105	31	1,923	84	24,029	15
Amount written off as loss by Orders-in-Council —April 1, 1956, to March 31, 1957.....	128,377	27	302,870	59	431,247	86
TOTAL CREDITS.....	150,482	58	304,794	43	455,277	01
Amount outstanding March 31, 1957.....	337,991	03	681,279	29	1,019,270	32

7. Road Construction and Maintenance

Location	Work
NORTHWEST TERRITORIES	
Mackenzie Highway.....	40 miles completed Yellowknife extension. Half of remainder surveyed. Resurfacing of 24 miles main highway completed. Material stockpiled for 1957 work.
East 3, new site of Aklavik.....	Temporary road to airport site.
YUKON TERRITORY	
Whitehorse.....	Steel highway bridge completed over Yukon River.
Whitehorse-Mayo Road.....	Steel highway bridge completed over Takhini River; mile post signs erected; resurfacing.
Atlin Road.....	Maintenance.
Elsa-Keno Road.....	Construction begun.

8. Building Construction

Location	Work
NORTHWEST TERRITORIES	
East 3, new site of Aklavik.....	90 Eskimo-type houses; large warehouse—work shop and four unheated warehouses; preliminary work on school and hostels project.
Cambridge Bay.....	Materials delivered for 1957 construction program.
Fort McPherson.....	Work started on large school and hostel.
Rae.....	One-classroom school and 3-bedroom house constructed.
Fort Resolution.....	2-unit apartment block constructed.
Fort Smith.....	Work started on 200-pupil hostel, 14-classroom school, 6-unit apartment building, addition to administration building, 3 semi-detached houses and a 3-bedroom residence; completion of 3 semi-detached houses and garage-workshop.
Frobisher Bay.....	36 Eskimo-type houses, one 3-bedroom residence, small warehouse, and fire hall constructed.
Hay River.....	A 3-classroom addition to the school, 3-unit apartment building, and a combined office-warehouse.
Yellowknife.....	School and hostel started and 2 semi-detached houses and a 4-unit apartment building completed.
Lake Claire, Wood Buffalo Park.....	Abattoir started and ancillary buildings, corrals, and guide fences constructed.
YUKON TERRITORY	
Mayo.....	Pre-cut log residence.
MANITOBA	
Churchill.....	9 pre-cut log residences erected.

9. Summary of Mining and Lands Division Revenue

	N.W.T.		Yukon		Provinces		Total	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.
Mining.....	330,594	84	168,956	92	22,685	47	522,237	23
Oil and Gas.....	576,627	62	66,487	72	293,093	28	936,208	62
Lands, Timber and Grazing.....	146,630	48	63,943	76	55,711	51	266,285	75
TOTAL.....	1,053,852	94	299,388	40	371,490	26	1,724,731	60

APPENDIX C

1. Location, Area, and Comparative Statement of Visitors to the National Parks for the Period April 1 to March 31

	Province	Area	1956-1957	1955-1956	Increase or Decrease
NATIONAL PARKS—					
Banff.....	Alta.	2,564 sq. mi.	717,799	701,199	+ 16,600
Cape Breton Highlands.	N.S.	377 "	116,556	75,310	+ 41,246
Elk Island.....	Alta.	75 "	159,531	170,692	- 11,161
Fundy.....	N.B.	79.5 "	120,666	105,487	+ 15,179
Georgian Bay Islands...	Ont.	5.4 "	25,175	23,440	+ 1,735
Glacier.....	B.C.	521 "	562	623	- 61
Jasper.....	Alta.	4,200 "	269,704	153,987	+115,717
Kootenay.....	B.C.	543 "	330,412	279,559	+ 50,853
Mount Revelstoke.....	B.C.	100 "	16,011	11,143	+ 4,868
Point Pelee.....	Ont.	6 "	572,694	600,254	- 27,560
Prince Albert.....	Sask.	1,496 "	115,591	117,621	- 2,030
Prince Edward Island..	P.E.I.	7 "	181,692	172,884	+ 8,808
Riding Mountain.....	Man.	1,148 "	572,084	566,793	+ 5,291
St. Lawrence Islands....	Ont.	172 acres	49,175	74,907	- 25,732
Waterton Lakes.....	Alta.	203 sq. mi.	246,466	227,291	+ 19,175
Yoho.....	B.C.	507 "	35,858	23,959	+ 11,899
Sub-total.....		11,832.2 sq. mi.	3,529,976	3,305,149	+224,827
NATIONAL HISTORIC PARKS—					
Fort Anne.....	N.S.	31 acres	21,362	20,946	+ 416
Fort Battleford.....	Sask.	37 "	12,384	10,818	+ 1,566
Fort Beauséjour.....	N.B.	81 "	23,509	23,572	- 63
Fort Chambly.....	P.Q.	2.5 "	70,580	72,090	- 1,510
Fort Lennox.....	P.Q.	210 "	11,637	14,610	- 2,973
Fortress of Louisbourg..	N.S.	339.5 "	18,068	23,022	- 4,954
Fort Malden.....	Ont.	5 "	20,663	16,356	+ 4,307
Fort Wellington.....	Ont.	8.5 "	13,243	10,918	+ 2,325
Halifax Citadel.....	N.S.	37 "	213,860	121,213	+ 92,647
Port Royal Habitation.	N.S.	20.5 "	23,816	20,457	+ 3,359
Sub-total.....		772.0 acres	429,122	334,002	+ 95,120
GRAND TOTAL.....		11,833.4 sq. mi.	3,959,098	3,639,151	+319,947

N.B.—No attendance records available for Wood Buffalo Park, Alta.-N.W.T. (17,300 sq. mi.); Woodside Historic Park, Kitchener, Ont. (11 acres); Fort Prince of Wales, Churchill, Man. (50 acres); Lower Fort Garry, Man. (13 acres); Alexander Graham Bell Museum, Baddeck, N.S. (14 acres).

2. Maintenance of Roads

National Parks	Location	Work
BANFF.....	Trans-Canada Highway:	
	Mile 0 - Mile 10.8.....	Gravelling completed; entire section received bituminous base course.
	Mile 10.8 - Mile 14.3.....	Bituminous base course applied.
	Mile 14.3 - Mile 14.8.....	Gravelling completed; Bow River bridge and C.P.R. overpass 62 per cent complete.

2. Maintenance of Roads—(Cont'd.)

National Parks	Location	Work
BANFF— <i>Con.</i>	Mile 14.8 – Mile 21.....	Base ready for surfacing.
	Mile 21 – Mile 31.....	Grading 60 per cent complete.
	Mile 31 – Mile 43.....	Grading work.
	Mile 43 – Mile 51.....	Grading work nearly completed; gravelling 75 per cent complete; four small bridges at Wolverine, Redearth, Altrude, and Moraine Creeks completed; work started on two bridges over the Bow River and on the Pipestone River bridge.
	Banff-Jasper Highway:	
	Mile 0 – Mile 22.....	Gravelling completed.
	Mile 22 – Mile 28.....	Grading completed; gravelling 90 per cent complete.
	Mile 28 – Mile 34.....	Grading and gravelling nearly completed; bridge at Mosquito Creek 25 per cent complete; bridge at No-see-um Creek 90 per cent complete.
	Mile 34 – Mile 40.....	Clearing completed.
	Mile 40 – Mile 92.5.....	Survey work completed.
	Banff-Windermere Highway:	
	Mile 0 – Mile 5.5.....	Clearing completed.
JASPER.....	Jasper-Banff Highway.....	Bridges at Poboktan Creek and Astoria River under construction.
	Miette Hot Springs Road.....	1,010 bags calcium chloride laid; surface grading.
	Whistler Ski Hill Access Road....	Approximately one mile of road rebuilt.
KOOTENAY.....	Banff-Windermere Highway	
	Mile 32 – Mile 56.4.....	Clearing and widening operations almost completed; 2-inch crushed gravel laid in some sections.
	Sinclair Canyon–Sinclair Summit..	1,500-foot flexbeam guardrail installed.
YOHO.....	Trans-Canada Highway:	
	Mile 0 – Mile 10.....	Gravelling completed.
	Mile 10 – Mile 16.....	Grading work.
	Mile 17 – Mile 21.....	Asphalt base course applied.
	Mile 22 – Mile 26.....	Gravelling.
MOUNT REVELSTOKE.....	Park entrance.....	New approach road to park completed.
	Ski hill.....	Access road and parking lot completed.
FUNDY.....	Point Wolfe Road.....	Guard posts installed at Heuston Brook.
	Herring Cove Road.....	Crushed gravel spread on 2.1 miles of road.
	Dixon Brook.....	Bridge replanked.

2. Maintenance of Roads—(Cont'd.)

National Parks	Location	Work
CAPE BRETON HIGHLANDS.	Cabot Trail: Cheticamp entrance-French Mountain.....	Road widened, grades improved, and base course applied.
PRINCE EDWARD ISLAND..	Rustico-Cavendish Road.....	Asphalt chip topping.
	Gulf Shore Road: Cavehead Harbour-Brackley.....	Sand asphalt base completed; partially sealed and chipped.
	Rustico Island.....	Clearing operations 90 per cent complete.

3. Improvements to Trails

National Parks	Location	Work
BANFF.....	Alexandria River.....	6 miles of fire trail to the mouth of Castlets Creek completed.
	Spray River.....	4.5 miles fire trail completed.
	Cascade River.....	2 miles fire trail reconstructed.
JASPER.....	Geraldine Fire Trail.....	4 miles widened, ditched, graded and gravelled; several culverts put in.
	Signal Mountain Fire Trail.....	6 miles ditched and graded.
	Devona - Snake Indian Falls Fire Trail.....	30 miles ditched and graded.
	Yellowhead - Miette River Pony Trail.....	Half-mile trail constructed; six small bridges replaced.
	Maligne Lake.....	2½ miles pony and walking trails constructed.
YOHO.....	Emerald Lake, Yoho Valley.....	600 feet bridging installed; 75-foot bridge constructed.
ELK ISLAND.....	Oster Trail.....	4 miles regraded, ditches improved, culverts repaired, and section gravelled.
RIDING MOUNTAIN.....	Central Fire Road.....	Additional 6 miles constructed.
	Strathclair Fire Road.....	Several culverts and bridges replaced.
	Riding Mountain Fire Road.....	Bridge over Rolling River replaced.
	Townsite.....	Additional 2 miles pony trail constructed.
FUNDY.....	Shepody Trail.....	Approaches to new bridge over Broad River completed.
CAPE BRETON HIGHLANDS.	Clyburn Bridge - Franey Mountain Lookout Tower.....	Cleared and bulldozed.
	Cheticamp River Trail.....	Seven bridges constructed; two foot-bridges constructed across the river.
	Broad Cove Trail.....	Ditched and gravelled.

4. Mileage of Park Roads, Trails, and Telephone Lines

National Parks	Motor Roads	Secondary Roads	Fire Roads	Trails	Telephone Lines
Banff.....	183.0	—	121.75	724.10	280.75
Cape Breton Highlands.....	53.97	7.51	23.87	21.82	14.34
Elk Island.....	18.00	—	—	20.00	22.50
Fundy.....	19.90	—	36.60	25.70	17.00
Georgian Bay Islands.....	—	—	10.00	18.25	—
Glacier.....	—	—	25.75	106.50	2.00
Jasper.....	146.50	20.00	91.00	601.50	503.10
Kootenay.....	60.60	—	46.00	138.00	63.10
Mount Revelstoke.....	18.50	—	—	58.25	8.25
Point Pelee.....	11.50	2.00	2.00	1.50	—
Prince Albert.....	65.70	75.75	—	268.75	161.00
Prince Edward Island.....	15.15	4.85	—	—	—
Riding Mountain.....	74.30	11.90	5.00	10.00	140.50
Waterton Lakes.....	43.80	13.50	29.00	83.00	60.00
Yoho.....	45.0	—	38.50	226.00	72.80
TOTAL.....	755.92	135.51	429.47	2,303.37	1,345.34

5. Major Construction in Parks

National Park	By National Parks Branch	By Private Enterprise
BANFF.....	East wing of Administration Building altered to accommodate District Treasury Office; work began on a kitchen-dining hall on the Banff-Jasper Highway; retaining wall at the Cave and Basin 75 per cent complete.	(a) <i>Townsite</i> : Construction commenced on 45-bed hospital and a 12-room public school; 6 cabins; 10 motel units; (b) <i>Outside townsite</i> : work completed on the headquarters building, 6 N.C.O. staff buildings, 15 cadet buildings, and the officers quarters at the National Cadet Camp (Department of National Defence). A total of 81 building permits were issued during the year with a total construction value of \$1,183,102.85.
JASPER.....	Work camp at Mile 60, Banff-Jasper Highway; work camp at Pocahontas; 2-double garages; combination dining room and kitchen at Maligne Lake.	Post Office addition; service station; theatre remodelled; 5 private homes. A total of 56 building permits were issued during the year with a total construction value of \$598,600.
KOOTENAY.....	Stores and workshops building at McKay Creek nearing completion; 465 feet of four-inch pipe, 700 feet of six-inch sewer tile, 100 feet of four-inch sewer pipe installed at this project. An addition to the combined staff quarters and information bureau to provide public rest-room facilities; structural, electrical, and plumbing repairs to three staff residences.	Renovation to a lodge to provide a cocktail lounge.
ELK ISLAND.....	Duplex staff residence; Oster Lake warden cabin; West Gate office.	
PRINCE ALBERT.....	Semi-detached staff residence; equipment sheds at golf course and work compound.	4 cottages; addition to a hotel; new motel; boat warehouse and workshop.

5. Major Construction in Parks—(Cont'd)

National Park	By National Parks Branch	By Private Enterprise
RIDING MOUNTAIN.....	2 double garages; 2 tool houses; combined garage and work-shop; 2 barns; new heating and plumbing units were installed in several staff residences.	Dining hall and chapel, recreation building at a church camp; 9 cabins.
FUNDY.....	Alterations to golf clubhouse to include a walk-in refrigerator and storage room; men's dressing room at bath-house was enlarged; florescent lights installed on 2nd floor of administration building; warden's cabin at Lake Brook.	2 buildings by New Brunswick School of Arts and Crafts.
CAPE BRETON HIGHLANDS..	An addition to the garage at Ingonish Beach; warehouse relocated and enlarged at Ingonish Beach; cabin at Franey Mountain fire-tower.	Staff residence at Keltic Lodge; caretaker's residence at Keltic Lodge completed.
PRINCE EDWARD ISLAND...	Renovations including reshingling, rewiring, plumbing, and structural improvements at Dalvay House; clerk's residence renovated, new heating system installed in Superintendent's residence and office; two-car garage at Park Headquarters.	
ST. LAWRENCE ISLANDS.....	Gordon and Beau Rivage Islands.	New kitchen shelters erected and children's playground equipment installed.

6. Improvements to Townsites

National Parks	Location	Work
BANFF.....	Bow Avenue.....	Sewer extended 1,800 feet.
	St. Julien Avenue.....	Work commenced on widening and realignment.
JASPER.....	Geikie Street.....	Street regavelled.
	Patricia Street.....	Street widened between Miette and Pyramid Avenues.
	Connaught Drive.....	850-foot curb and gutter installed; landscaping carried out; street lights on north side of street installed.
	Pyramid Avenue.....	Curbs constructed around boulevards from Geikie Street to Pyramid Lake Road.
KOOTENAY.....	McKay Street.....	Townsite water system extended with installation of 2,600 feet of 8-inch cast iron water-main, float and pressure-reducing valve chambers.
FUNDY.....	Dixon Brook.....	Parking area extended 60 feet.

7. Additions to Recreational Facilities

National Parks	Location	Work
BANFF.....	Tunnel Mountain camp-ground.....	2 old shelters replaced; 2 buildings moved to site to provide staff quarters; registration building and camp-ground store connected to gas distribution system.
	Tunnel Mountain trailer park.....	Septic tank installed; sewer main and half-block of sewer connections installed; foundations laid and frames erected for the 2 service buildings.
	Sundance Canyon picnic grounds....	Additional cooking shelter, 2 fire circles, 4 additional picnic tables, new toilet facilities, a hitching rail for horses, and enlarged parking space provided.
	Mount Norquay.....	New ski jump is 75 per cent complete.
JASPER.....	Miette Hot Springs bath-house....	Parking facilities enlarged; improvements made to water lines and pressure system.
	Cottonwood Creek camp-ground..	Concrete bases for propane gas tanks and supply lines installed.
YOHO.....	Kicking Horse camp-ground.....	New shelter completed.
	Takakkaw Falls camp-ground.....	Area around picnic shelters cleared.
KOOTENAY.....	Aquacourt.....	275-foot concrete sidewalk and retaining wall constructed; area extensively landscaped and parking area enlarged.
PRINCE ALBERT.....	Narrows camp-ground.....	Kitchen shelter erected.
	Paignton Beach.....	2 fireplace shelters erected.
	Waskesiu camp-ground.....	4 new comfort stations erected.
POINT PELEE.....	Picnic areas.....	5 new comfort stations and 4 new kitchen shelters constructed.
RIDING MOUNTAIN.....	Lake Katherine camp-ground.....	Kitchen shelter erected.
FUNDY.....	Swimming pool.....	Men's dressing room enlarged to provide 6 additional dressing cubicles.
	Headquarters camp-ground.....	Comfort station enlarged to provide showers and laundry tubs.
CAPE BRETON HIGHLANDS.	Ingonish Beach camp-grounds.....	15 additional tent lots and 5 additional trailer lots provided; sinks installed at 3 kitchen shelters.
	Rigwash picnic grounds.....	Parking area enlarged.
	South Mountain picnic grounds....	New fireplace built.
	Clyburn picnic grounds.....	New picnic area opened; double fireplace constructed.

8. Fire Losses in the National Parks

National Park	Number of Fires		Area Burned (acres)		Cost of Suppression	
	1951-55 Av.	1956	1951-55 Av.	1956	1951-55 Av.	1956
					\$ cts.	\$ cts.
Banff.....	8.8	12	22.4	1.1	737 43	676 63
Jasper.....	3.2	8	2.8	13.6	297 64	2,127 42
Glacier.....	3.2	1	61.6	25	622 66	576 72
Kootenay.....	1.2	3	spot	7	36 18	7,541 46
Yoho.....	3.0	5	179.4	.3	4,125 71	138 00
Revelstoke.....	1.4	1	1.2	122	302 64	1,542 00
Waterton Lakes.....	0.2	1	spot	0.4	Nil	43 72
Elk Island.....	0.2	0	30.0	—	—	—
Prince Albert.....	1.8	1	3,819.9	0.1	1,838 93	34 86
Riding Mountain.....	3.2	1	190.6	5	471 04	37 00
Georgian Bay Islands.....	0.4	0	spot	—	Nil	—
St. Lawrence Islands.....	2.0	0	0.8	—	19 58	—
Point Pelee.....	0.2	0	spot	—	1 25	—
Fundy.....	0.4	0	9.0	—	506 20	—
Prince Edward Island.....	0.6	0	0.1	—	1 20	—
Cape Breton Highlands.....	1.2	1	0.3	—	22 27	63 80
TOTAL.....	31	34	4,318.1	174.5	8,982 73	12,781 61

9. Reduction of Mammals

National Park	Mammal	Number Killed	Disposal of Meat and Hides
BANFF.....	Buffalo	3	Meat and hides donated to Banff Indian Days Committee.
	Elk	36	
JASPER.....	Elk	152	Meat and hides donated to Indian Affairs Branch.
ELK ISLAND.....	Buffalo	350	Meat and hides sold.
	Elk	298	Meat and hides donated to Indian Affairs Branch.
	Moose	150	
POINT PELEE.....	Muskrat	2,022	Hides sold by tender.

10. Statement of Large Mammals in Fenced Enclosures in National Parks

	Buffalo	Elk	Moose	Mule Deer	White-tailed Deer	Total
Banff Park Paddock.....	11	—	—	—	—	11
Elk Island Park Paddock.....	1,052	1,149	216	40	55	2,512
Prince Albert Park Paddock....	12	—	—	—	—	12
Riding Mountain Park Paddock...	24	20	2	—	37	83
Waterton Lakes Park Paddock....	19	—	—	—	—	19
TOTAL.....	1,118	1,169	218	40	92	2,637

11. Comparative Statement of Attendance at National Park Bathing Establishments

National Park	Name of Pool	1956-57	1955-56
Banff.....	Upper Hot Springs.....	159,370	145,782
	¹ Cave and Basin.....	117,164	121,721
Jasper.....	¹ Miette Hot Springs.....	54,608	40,536
	¹ Jasper Townsite Pool.....	26,141	21,767
Kootenay.....	Radium Hot Springs Aquacourt.....	173,650	165,431
Fundy.....	¹ Fundy Park Pool.....	18,697	18,984

¹ Open in summer only.**12. Members of Historic Sites and Monuments Board**

Professor Fred Landon, London, Ont. (Chairman).

The Reverend Antoine d'Eschambault, Genthon, Man.

Dr. Walter N. Sage, Vancouver, B.C.

The Honourable Thane A. Campbell, Chief Justice of Prince Edward Island, Charlottetown, P.E.I.

Dr. W. Kaye Lamb, Dominion Archivist, Ottawa, Ont.

Dr. Alfred G. Bailey, Dean of Arts, Fredericton, N.B.

Dr. C. Bruce Fergusson, Halifax, N.S.

Richmond Mayson, Esq., Prince Albert, Sask.

H. J. W. Walker, Esq., Ottawa, Ont.

Edouard Fiset, Esq., Quebec, P.Q.

Jules Bazin, Esq., Montreal, P.Q.

O. L. Vardy, Esq., St. John's, Nfld.

Joel K. Smith, Esq., Edmonton, Alta.

A. J. H. Richardson, Esq., National Historic Sites Division, Ottawa, Ont., (Secretary).

13. Major Improvements and Repairs to National Historic Parks and Sites

National Historic Site	Nature of Work
Signal Hill, St. John's, Nfld.....	Powder magazine restored, repairs to exterior of Cabot Tower, general clean-up of park area.
Fortress of Louisbourg, N.S.....	Retracement and construction of road system within boundaries continued, improvements to King's Garden carried out, repair work to sewer system.
Alexander Graham Bell Museum, Baddeck, N.S.	Access road, parking area, and landscaping completed. Stone retaining walls and entrance gates erected, and water and sewer services installed.
Halifax Citadel, N.S.....	Reconstruction of walls at Citadel continued, including repointing, restoration of casemates and dungeon. Installation of power-lines for floodlighting Clock Tower and interior of Citadel. Preparations made for lighting grounds 1957-58. Improvements made to glacis, work done on main entrance road, continuation of fencing, and construction of entrance gates.

13. Major Improvements and Repairs to National Historic Parks and Sites—(Cont'd)

National Historic Site	Nature of Work
Fort Edward Blockhouse, Windsor, N.S.....	Replacement of lower logs, covering with plank siding completed.
Fort Anne, Annapolis Royal, N.S.....	Work done on landscaping of area adjacent to Custodian's new residence, curb and gutter constructed around museum, chimney repaired.
Fort Beauséjour, N.B.....	Extension of lawns completed to cover area around advanced trenches; levelling of floor of moat.
Fort Gaspereaux, N.B.....	Restoration of retaining wall partially finished.
Quebec Walls and Fortifications, P.Q.....	Continuation of repointing and rebuilding wall undertaken. Floodlighting installed on St. Louis Gate.
Sir Wilfrid Laurier's Birthplace, St. Lin des Laurentides, P.Q.....	Major repairs to house, redecorating, heating unit installed.
Carillon Barracks, P.Q.....	Minor repairs to building, new heating unit installed.
Fort Chambly, P.Q.....	Picnic area fenced, emergency repairs to disintegrating walls.
Fort Wellington, Prescott, Ont.....	Continuation of replacement of palisades, banquette on top of ramparts, and entrance gate; repairs to caponnière, replacement of floor in Custodian's quarters.
Woodside, Kitchener, Ont.....	Materials purchased for fencing, ventilation unit installed in basement gallery, combined garage-workshop constructed. Floodlighting installed for house; levelling of grounds in park.
Fort Malden, Amherstburg, Ont.....	Steel sheet piling obtained for repairs to breakwater 1957-58 by Public Works Department, Hough House (museum building) reroofed, ornamental lighting standards installed in park, historic site fenced.
Fort Prince of Wales, Churchill, Man.....	Work done on restoration of outer walls; purchases of equipment made for major work in 1957-58.
Lower Fort Garry, Man.....	Toilet building constructed in southeast bastion, restoration and repair work done on Doctor's residence, Fur Storage Building, northeast and southwest bastions.
Rectory, Batoche, Sask.....	Repairs to building continued, restoring it to condition in 1885 and preparing it for use as a museum.
Fort Battleford, Sask.....	Materials purchased for underground power line, minor improvements to grounds, fencing.
Fort Langley, B.C.....	Work commenced on restoration of old Hudson's Bay Company post, restoration of No. 3 building commenced, northeast bastion finished, car parking area and palisades completed, landscaping underway.

14. Historic Sites Marked and Important Persons Commemorated

Place	Event or Person
NEW BRUNSWICK—	
St. Anne du Bocage.....	Return of the Acadians.
Shediac.....	Men of Letters.
ONTARIO—	
Woodstock.....	Woodstock Town Hall.
London.....	Middlesex County Court House.
MANITOBA—	
Portage la Prairie.....	First Homestead in Western Canada.

15. Banding of Wild Birds

Species	Number
Banded in 1956—	
Ducks (including Coots).....	31,698
Geese (including Brant).....	6,764
Trumpeter Swans.....	22
Colony nesting water birds (gulls, terns, cormorants, etc.).....	40,945
Other migratory birds.....	35,459
TOTAL, 1956.....	114,888
Banded to date.....	1,074,497
Banded birds recovered to date.....	97,116
(This total includes birds banded in Canada and recovered in Canada or elsewhere; also records of birds banded elsewhere than in Canada and recovered in this country.)	

16. Licences and Permits Issued Under the Migratory Birds Convention Act

Nature of Permit or Licence	Number Issued
To collect birds for scientific purposes.....	422
For local control of great black-backed gull.....	1
To take migratory birds for propagation.....	5
To possess migratory birds for propagation.....	785
For bird-banding.....	230
For taxidermy.....	78
TOTAL.....	1,521

17. Distribution of Wildlife Publications

Publication	Number Issued
Consolidation of Migratory Birds Convention Act and Regulations.....	10,860
Abstracts of Migratory Bird Regulations.....	52,753
Educational and Instructive Pamphlets.....	20,773

APPENDIX D

1. Details of Stream Gauging

District Office	Gauging Stations	Discharge Measurements	Co-operating Agencies	Special Programs
Vancouver..... (Sub-offices in Kamloops, Nelson, Cranbrook, Prince George, Revelstoke, Whitehorse).	353 (225 all year)	1,218	British Columbia Water Rights Branch British Columbia Power Commission British Columbia Game Commission. British Columbia Electric Co. Ltd. East Kootenay Power Co. Ltd. West Kootenay Power and Light Co. Ltd. Crown Zellerbach Canada Ltd. H. R. MacMillan Export Co. Ltd. Northwest Power Industries Ltd. Greater Vancouver Water District Vancouver and District Joint Sewerage and Drainage Board City of Penticton Village of Abbotsford Creston Dyking District Department of Fisheries Department of Public Works United States Geological Survey United States Corps of Engineers Bonneville Power Administration United States Weather Bureau	Columbia River investigations. Yukon River investigations. Fraser River basin studies. Fisheries research.
Calgary..... (Sub-office in Shaunavon).	252 (70 all year)	2,195	Alberta Water Resources Branch Saskatchewan Water Rights Branch Eastern Rockies Forest Conservation Board Canadian Utilities Ltd. Northland Utilities Ltd. Calgary Power Ltd. Consolidated Mining and Smelting Co. Ltd. West Kootenay Power Co. City of Calgary Northern Transportation Co. Prairie Farm Rehabilitation Administration United States Geological Survey.	International gauging stations on Milk, St. Mary and other prairie rivers. General reconstruction of stream gauging structures.

1. Details of Stream Gauging—(Cont'd)

District Office	Gauging Stations	Discharge Measurements	Co-operating Agencies	Special Programs
Winnipeg..... (Sub-offices in Keewatin and Fort Frances).	187 (115 all year)	1,026	Manitoba Water Resources Branch Hydro-Electric Power Commission of Ontario Saskatchewan Water Rights Branch Manitoba Hydro-Electric Board Churchill River Power Co. Ontario-Minnesota Pulp and Paper Co. Ltd. Prairie Farm Rehabilitation Administration United States Geological Survey United States Corps of Engineers	International prairie rivers. Flood control of Manitoba lakes.
Ottawa..... (Sub-offices in North Bay and Niagara Falls).	171 (162 all year)	511	Hydro-Electric Power Commission of Ontario Ontario Department of Planning and Development Quebec Department of Hydraulic Resources Grand River Conservation Commission Great Lakes Power Co. Gatineau Power Co. Abitibi Pulp and Paper Co. International Nickel Co. Northern Quebec Power Co. Spruce Falls Pulp and Paper Co. South River Electric Co. Pembroke Electric Commission Department of Public Works Department of Mines and Technical Surveys	Niagara River Studies and assistance to international boards. St. Lawrence River meterings.
Montreal..... (Sub-office in Rimouski).	176 (168 all year)	457	Quebec Department of Hydraulic Resources Shawinigan Water and Power Co. Aluminum Co. of Canada, Ltd. Gatineau Power Co. Price Brothers and Company, Ltd. Quebec Power Co. Power Corporation of Canada Lower St. Lawrence Power Co. Quebec North Shore Power Co. Dominion Textile Co. Ltd. Canada Paper Co. Donnacona Paper Co. Gulf Power and Paper Co. City of Sherbrooke	Metering of outflow and rating of storage reservoirs. Checking of power station ratings. International gauging stations on Richelieu and Magog Rivers.

1. Details of Stream Gauging—(Cont'd)

District Office	Gauging Stations	Discharge Measurements	Co-operating Agencies	Special Programs
Halifax..... (Sub-office in St. John's, Newfoundland).	44 (39 all year)	227	Nova Scotia Power Commission New Brunswick Electric Power Commission Newfoundland Depart- ment of Mines and Resources. Bowater Power Co. Newfoundland Light and Power Co. United States Geolog- ical Survey.	Discharge measure- ments in Hamilton River basin.

2. Run-off Conditions in Canada

District	Mean Run-off	Variations in River Flows
British Columbia.....	110 per cent of mean for 5 rivers.	Run-off generally excessive in southern region and deficient in northern coastal area of mainland during April to June; about normal in most areas for balance of year except for excessive flows June to August on Vancouver Island and deficient flows in coastal areas during February. New high records of mean monthly and mean daily flow for June on Sproat River. Record high daily flow for January on Skeena River. Inflow to Kootenay Lake on May 24 and 25 exceeded the peak flow recorded in 1948.
Eastern Slope Rocky Mountains	101 per cent of median for 3 rivers	Run-off normal to excessive during April to July; generally deficient for remainder of year, though excessive in extreme southern area in February. New daily low record for August on North Saskatchewan River.
Southern Alberta and Saskatchewan.	Run-off in Cypress Hills area during March to October was below median after six successive years of above normal discharge during that season. Heavy snow melt in 1956 caused excessive flooding in Qu'Appelle River basin with all time record high stages at some loca- tions on Qu'Appelle River and some of its tributaries. Total run-off almost as high as during 1955 flood; no other comparable flood on record except perhaps in 1883 and 1904. Extreme stages also in Carrot River Basin.
Manitoba.....	433 per cent of median for one river.	Assiniboine River flows continued excessive throughout the year. Red River above normal except for four months during autumn and winter period. Saskatchewan and Churchill Rivers about normal for the year; Nelson River well above normal. Manitoba lakes at levels about 2 feet above average.
Northwestern Ontario..	128 per cent of median for one river.	English River normal to excessive except for moderately below median flows during August through September.

2. Run-off Conditions in Canada—(Cont'd)

District	Mean Run-off	Variations in River Flows
James Bay Drainage....	101 per cent of median for 2 rivers.	Missinaibi River in Ontario generally below normal, except for excessive flows during period June through September. Harricana River in Quebec above normal during April through October, then slightly below normal for remainder of year.
Great Lakes.....	106 per cent of median for 4 rivers.	Run-off from area north of Lake Huron below normal for year; new low record of daily flow for Aux Sables River established for April. Run-off east of Georgian Bay above normal for year, being deficient in April and excessive during July through October. New low record of daily flow for April also new high records of daily and monthly flows for September established for North Magnetawan River. Southern Ontario run-off generally between normal and excessive except for low flows in November.
Quebec.....	90 per cent of median for 3 rivers.	In area north of St. Lawrence River, flows generally deficient during April, May, and from November through March; above normal during summer months. New record low monthly flow for May on Outardes River. Extreme southern Quebec run-off below normal in April, July, and November through January; otherwise above normal. New record low daily flow for April on St. François River.
New Brunswick.....	87 per cent of median for 2 rivers.	Run-off in St. John River basin well below normal except for June and March. Lepreau River well below normal August through November; otherwise above normal to excessive.
Nova Scotia.....	102 per cent of median for 2 rivers.	La Have River above normal except for July through November. St. Mary River above normal during April, May, July, and March; otherwise below normal to deficient. New record low monthly flow for October and low daily flow for November on St. Mary River.
Newfoundland.....		Based on 7-year record, run-off on island below average except for period April to June. In Labrador continuous records for Hamilton River commenced 1954. Past year's freshet flows highest on record; above normal flows during remainder of year.

3. Snow Surveys

District	Location	Co-operating Agency	Average Water Content of Snow Cover
Calgary.....	St. Mary River basin (May)	U.S. Geological Survey.	150 per cent of 34-year average.
	Bow River basin (April).	—	135 per cent of 20-year average.
	Cypress Hills (Feb.).....	—	Lower than average water content.
	North Saskatchewan River (April).	—	—
Winnipeg.....	Lake of the Woods basin (March)	U.S. Corps of Engineers. Hydro-Electric Power Commission of Ontario.	91 per cent of median.
	Lac Seul (March).....	Hydro-Electric Power Commission of Ontario.	91 per cent of median.
Ontario.....	Central region—6 courses (March)	Hydro-Electric Power Commission of Ontario.	Close to median in Wapitei and Sturgeon River basins; averaged 70 per cent of median in South Magnetawan and Muskoka River basins.
New Brunswick	Saint John and Lepreau River basins—10 courses (March)	N.B. Electric Power Commission.	5.2 inches.
Nova Scotia....	From Barrington to Antigonish—11 courses (March)	—	1.9 inches.

4. Glacier Surveys

Region	Number of Glaciers	Average Total Recession 1954-56 Feet	Rate of Ice Flow Feet per Year
Banff Park.....	2	109	13.5 ¹
Jasper Park.....	1	100	50
Selkirk Mountain Range.....	2	—	—
Coast Mountain Range.....	2	—	—

¹ One observation.

5. Boards on Which Water Resources Branch Has Membership

Board	Purpose	Details of Operation
FEDERAL-PROVINCIAL— Canadian Lake of the Woods Control Board	To supervise water levels within prescribed limits of storage.	Supervised the operation of control structure, compiled records.
Prairie Provinces Water Board	To study the interprovincial waterway problems of the three prairie provinces.	Participated in studies of current and future water requirements.

5. Boards on Which Water Resources Branch Has Membership—(Cont'd)

Board	Purpose	Details of Operation
Fraser River Board.....	To survey and report on the water resources and requirements of the area comprising the Fraser River Basin.	Completed interim flood control report and commenced preparation of preliminary report with particular attention to flood control and power development; also continued co-operative hydrometric survey program.
Lakes Winnipeg and Manitoba Board	To study possibilities of flood control, power development, and other uses of waters flowing into and out of these lakes.	Commenced field surveys and office studies.
INTERNATIONAL—		
St. Croix River Board of Control	To supervise water levels....	Maintained records of levels and inspected control structures.
Lake Memphremagog Board.	To supervise water levels....	Maintained records of levels.
Lake Champlain Board of Control	To supervise water levels.....	Maintained records of levels.
St. Lawrence River Board of Control	To supervise control of the levels of and outflow from Lake Ontario.	Approved plans and specifications for works in International Rapids Section of the St. Lawrence, in so far as those works would affect the levels and flow of the St. Lawrence River and Lake Ontario; computed pre-project levels and flows; carried out hydrometric survey on St. Lawrence River.
Massena Board of Control....	To supervise diversion of water from St. Lawrence River by the St. Lawrence River Power Company and maintain navigation levels at Lock No. 21.	Inspected control structure and maintained records.
Niagara Board of Control....	To supervise water levels and the construction of remedial works at Niagara Falls.	Maintained close check on levels above falls, approved plans and specifications for remedial works, inspected construction of such works.

6. Developments Under Dominion Water Power Regulations

Development	Date Licensed	Power Output Kwh-1956	Rental Received	Other Details
			\$ cts.	
Porter Creek (Yukon Hydro Co.).....	March 1952	2,541,872	344 96	
McIntyre Creek (Yukon Hydro Co.).....	March 1955	2,370,080	600 00	Final licence under preparation.
Lake Minnewanka and Cascades (Calgary Power Ltd.)	May 1947	68,163,600	9,384 18	Amendment to final licence issued 23 July, 1956.
Yellowknife (Consolidated Mining and Smelting Co.)..	Dec. 1942	25,905,600	3,196 08	

6. Developments Under Dominion Water Power Regulations—(Cont'd)

Development	Date Licensed		Power Output Kwh-1956	Rental Received	Other Details
Lake Louise (C.P.R.).....	May	1919	—	—	New licence under pre- paration.
Ghost (Calgary Power Ltd.).	May	1947	191,871,200	13,808 63	Federal share of rental collected for Indian Affairs Branch.
Kananaskis (Calgary Power Ltd.).....	Oct.	1912	—	3,898 63	Federal share of rental col- lected for Indian Affairs Branch. Renewal licence issued 7 December, 1956.
Horseshoe (Calgary Power Ltd.).....	Oct.	1909	—	12,152 54	Federal share of rental col- lected for Indian Affairs Branch. Renewal licence issued 7 December, 1956.

7. Technical Assistance to Federal Agencies

Agency	Assistance by Water Resources Branch
Department of External Affairs.....	Membership on 4 international boards and provision of technical advice on international waterway problems.
International Joint Commission.....	Membership on 19 international boards and provision of technical advice to those on asso- ciated problems.
Department of Fisheries—	
Fish Culture Development Branch.....	Conduct of special hydrometric survey program.
Fisheries Research Board.....	Conduct of special hydrometric survey program.
International Pacific Salmon Fisheries Com- mission.....	Conduct of special hydrometric survey program.
Department of Agriculture—	
Prairie Farm Rehabilitation Administration	Co-operation in hydrometric surveys for irriga- tion purposes.
Department of Public Works.....	Co-operation in hydrometric surveys for regula- tion of Okanagan Lake and supply of hydro- metric survey data.
Department of National Health and Welfare..	Supply of hydrometric survey data.
Department of Northern Affairs and National Resources—	
National Parks Branch.....	Supervision of river diversions in Banff National Park.
Northern Administration and Lands Branch, Lands Division.....	Administration of certain federal lands in British Columbia.

APPENDIX E

1. Research in the Economics of Forestry

Commonwealth Forestry Conference Report

The Canadian report to the Seventh British Commonwealth Forestry Conference was compiled for publication from information supplied by forest authorities throughout the country. This report constitutes a summary of Canadian forestry conditions for the period 1951 to 1955.

Preparation of International Reports

Economic and statistical reports were prepared for submission to the Food and Agriculture Organization, the Organization for European Economic Co-operation, and the Economic Commission for Europe. Summaries were made of national and international statistics on production and trade in forest products for the use of Canadian delegates to FAO Conferences and international meetings.

Analysis of Primary Forest Statistics

Initiated during the previous year in co-operation with the Forestry Section of the Dominion Bureau of Statistics and the Forestry Study Group of the Royal Commission on Canada's Economic Prospects, the analysis has resulted in revised annual estimates of primary production for the years 1940 to 1955 and new methods for arriving at estimates of primary production from Crown and private lands.

Revision of Forest and Forest Products Statistics

The Forestry Branch Bulletin, *Forest and Forest Products Statistics, Canada*, was completely revised, its format being changed somewhat and additional basic statistics added. Included also was the revised National Forest Inventory, compiled from provincial sources.

2. Annual Forest Depletion¹

	Millions of Cu. Ft. of Usable Wood		Percentage of Depletion	
	1945-54	1955 ²	1945-54	1955
Products utilized ² —				
Logs and bolts.....	1,357	1,563	42.3	44.3
Pulpwood.....	1,152	1,367	35.9	38.7
Fuelwood.....	433	290	13.5	8.2
Other products.....	82	60	2.6	1.7
TOTAL.....	3,024	3,280	94.3	92.9
Wastage—				
By forest fires.....	183	251	5.7	7.1
GRAND TOTAL.....	3,207	3,531	100.0	100.0

¹ Does not include wastage caused by agencies other than fire, such as insects, diseases, and natural mortality, for which no reliable estimates are available.

² Figures have been revised and are provisional only, pending final review by D.B.S.

3. Forest Industries

SUMMARY OF PRINCIPAL STATISTICS, 1954

	Number of Employees	Salaries and Wages	Net Value ¹ of Production	Gross Value of Production
		\$	\$	\$
Woods operations ²	135,051 ³	471,000,000	628,772,000	728,370,000
Pulp and paper industry.....	60,837	252,598,383	641,517,070	1,241,665,451
Lumber industry.....	57,010	139,571,531	263,629,457	572,186,498
Wood-using industries.....	71,921	183,550,683	303,571,257	635,278,787
Paper-using industries.....	26,533	78,957,643	160,870,087	391,034,655
TOTAL.....	351,352	1,125,678,240	1,998,359,871	—

¹ Net value of production is gross or sale value, less cost of materials, fuel, purchased electricity, and process supplies consumed.

² Preliminary data, subject to further revision.

³ Man-year basis (300 working days).

4. Research Work of Forest Research Division

SILVICULTURE AND MANAGEMENT SECTION

Forest Classification

Further studies of the relative merits of systems of forest site classification which allot different degrees of emphasis to physiographic features, minor forest vegetation, and the forest itself; in the Maritimes emphasis has been on the climax concept, in Quebec on lesser vegetation, in Ontario on physiographic features, and in the Prairie Provinces and Newfoundland various combinations of these approaches are being followed. Revision of Forest Classification for Canada continued, as did work on subdividing some of the forest sections into smaller districts.

Ecology and Silvics

Intensive studies under controlled conditions of the differential response of seedlings of important tree species to variations in moisture, heat, and light; research on frost occurrence and injuries; studies of stand climate and growth response; studies of tree physiology, including the absorption of nutrients by trees and flowering phenomena in spruce at the Petawawa Forest Experiment Station. Ecological studies of the following forest types: white spruce, Engelmann spruce, and lodgepole pine in Alberta; spruce-aspen in Manitoba and Saskatchewan; white pine, red pine, yellow birch-sugar maple, aspen-birch-spruce-balsam in Ontario and Quebec; spruce-balsam and important mosses in the Maritimes. Continuation of work on the preparation of manuals to assist the recognition of forest plants and tree seedlings. Studies of nutrient deficiency and fertilization experiments in Quebec and Newfoundland.

Applied Silviculture

Cutting experiments in all districts on company lands and on experimental areas administered by the Branch. The principal experiments were with lodgepole pine near Strachan and Carrot Creek, and white spruce in both the Subalpine and Boreal Forest Regions of Alberta; jack pine and red pine at Sandilands, black spruce at Duck Mountain, and white spruce-aspen at Riding Mountain, Manitoba; white spruce-aspen at the Carrot River, Saskatchewan; spruce-balsam-birch-aspen at Heron Bay; tolerant hardwoods at Haliburton, Ontario; red spruce-fir-birch at Lake Edward, Quebec; balsam fir at Matane River, Quebec; black spruce and old-field white spruce in Nova Scotia; spruce-fir at Green River and Acadia, New Brunswick; spruce-balsam and balsam-white birch in Newfoundland. Most districts also conducted studies of seedbed improvement techniques using scarification, herbicides, or controlled burning.

Growth and Yield

Continuation of sample plot establishment or remeasurement which will result in empirical or normal yield tables for important species in each district. Special consideration was given to the correlation of these studies with methods of assessing site productivity.

Reforestation and Tree Breeding

Experimental plantings and direct seedings at all Forest Experiment Stations and in most provinces. Tree breeding program at the Petawawa and Acadia Forest Experiment Stations with particular emphasis on provenance tests with spruce, jack pine, and balsam fir; co-operation in tree breeding with industry, including a large-scale seed collection for a white spruce provenance study; investigations to produce fast-growing and resistant strains of different species and species hybridization; further progress in grafting techniques with conifers; development of plantations; selection, testing, and collection of material from superior trees.

Forest Management

Collection of basic data in each district for management of selected and important forest types; operation of demonstration woodlots on an experimental basis. Continued work on an area at Petawawa to practice and demonstrate intensive silviculture; assistance to Alberta and Newfoundland in developing forest management plans.

Mensuration

Checking continued on promising mathematic functions developed to express tree volume and growth relationships. Development in the organization of research data to permit compilation and computation by mechanical tabulation equipment and punch-cards.

FOREST INVENTORIES SECTION

Preparation of Stand Volume Tables

Volumetric data for use by the air photograph interpreter in making estimates of timber quantities collected in the field in accordance with four determinants: canopy density, average height weighted by volume, cover type, and site type. Based on these values stand volume tables were prepared and subdivided where necessary in accordance with the ratio of canopy density to basal area per acre. Two hundred and two sample plots were measured.

Determination of Most Suitable Methods of Air Photography

Research in the use of various cameras and films to increase the accuracy of fine tree measurements in air photographs and to facilitate the identification of tree species. Sharpness in air photography is difficult to maintain because the camera is on a moving platform; accordingly, tests were commenced in the comparison of results from fast shutters with those having means for compensatory movement of the film. Tests of camouflage detection film in the identification of dead foliage and the determination of the vigour of coniferous stands were commenced.

Development of Instruments

Advances in the technique of using air photographs for forest inventory purposes are accompanied by demands for new or improved instruments. Various polar planimeters were tested. The Rapidograph pen was found to be especially valuable in marking air photographs. A special table was designed for the use of the Seelyscope in plotting forest type lines.

Investigation of Forest Survey Techniques

Research in field sampling procedures and air photograph interpretation. Unless spaced closely for good sampling distribution, systematic strips gave poor results. Equi-spaced line plots gave a lower standard error and a slightly lower estimate of the mean than the random method. Equi-spacing of sample plots on a polar co-ordinate basis was indicated by a simple diagram. An exercise in the use of stereograms to maintain consistency in air photo interpretation was conducted.

Fulfilment of Departmental Survey Requirements

Forest inventories for areas in the Yukon and Northwest Territories, national parks, Indian reserves, and other federally administered lands, or for provincial lands where required.

FIRE PROTECTION SECTION

Forest Fire Danger Tables

Field studies at specially selected forest fire research stations in Saskatchewan and Alberta to obtain basic data for use in preparing fire danger tables for the specific areas concerned. Related projects at the Petawawa and Kananaskis Forest Experiment Stations. Simplified forest fire danger tables for Newfoundland, New Brunswick, Ontario, Manitoba, and the East Slope in Alberta, published and distributed. Arrangements made for the establishment of two forest fire research stations in British Columbia to begin operation during the 1957 fire season.

Weather in Relation to Fire Danger and Fire Behaviour

Comparisons of weather data made between Kananaskis Forest Experiment Station and ranger stations of the Eastern Rockies Forest Conservation Board showing low night humidities recorded at Kananaskis to be representative of conditions along a 200-mile length of the East Slope. Dew deposition investigations continued at three field stations.

Fire Season Severity

Development of a formula whereby small test fire data may be applied to fire season severity rating. Test of this method against actual fires in New Brunswick.

Increasing the Effectiveness of Forest Fire Control

Investigation of the performance characteristics of various back-pack tanks and hand pumps; investigations of use of centrifugal power pumps in tandem and in series; study of the effect of field use in the leaching of forestry hose mildew-proofers; measurement of discharge rates through forestry hose nozzles at high pressures; observation of control-burn experiments; review and summary of literature on induced precipitation.

5. Forest Fire Losses in Canada, 1955

(Compared with 10-year Average, 1945-54)
(Exclusive of Yukon and Northwest Territories)

Item	Annual Average 1945-54	1955
Total number of fires.	5,141	6,360
Total area burned (acres).....	1,373,596	1,379,567
Size of average fire (acres).....	267	217
Saw timber burned (Mft.b.m.)	382,041	238,141
Small material (cords).....	1,054,139	2,321,077
Actual cost of fire fighting.....(\$)	2,059,827	6,570,944
Other fire protection costs (1954).....(\$)	—	16,142,539
Area under protection (sq. mi.).....	—	1,052,590

6. Progress in Forest Inventories

Project Class	Estimated Area to be Covered	Prior to Fed.-Prov. Agreements	Approximate Area Covered		
			Under Fed.-Prov. Agreements		
			Prior to 1956-57	Fiscal Year 1956-57	Total to Date
	sq.mi.	sq.mi.	sq.mi.	sq.mi.	sq.mi.
Ground control surveys...	418,000	107,000	295,000	2,000	404,000
Air photography—					
Small scale.....	739,000	246,000	429,000	25,000	700,000
Medium scale.....	490,000	215,000	259,000	1,000	475,000
Total.....	1,229,000	461,000	688,000	26,000	1,175,000
Base maps—					
Small scale.....	636,000	74,000	471,000	27,000	572,000
Large scale.....	381,000	215,000	137,000	12,000	364,000
Total.....	1,017,000	289,000	608,000	39,000	936,000
Field surveys for forest data.....	974,000	157,000	606,000	144,000	907,000
Interpretation of photo- graphs.....	1,120,000	162,000	738,000	96,000	996,000
Forest maps.....	1,110,000	84,000	585,000	168,000	837,000
Inventory reports.....	1,060,000	53,000	680,000	25,000	758,000

7. Reforestation under the Forestry Agreements

Province	Number of Trees Planted		Area Planted		Area Seeded	
	Fiscal Year 1956-57	Total to Date	Fiscal Year 1956-57	Total to Date	Fiscal Year 1956-57	Total to Date
			acres	acres	acres	acres
Prince Edward Island..	95,000	251,000	81	211	—	—
Nova Scotia.....	188,000	466,000	290	561	—	—
Ontario.....	11,830,000	55,790,000	11,830	55,790	—	6,000
Manitoba.....	1,002,000	2,993,000	863	2,643	—	—
Saskatchewan.....	267,000	1,208,000	200	938	255	1,006
British Columbia.....	—	11,949,000	—	14,160	—	—
Total.....	13,382,000	72,657,000	13,264	74,303	255	7,006

8. Federal Payments to Provincial Governments Under the Forestry Agreements

Province	Forest Inventory		Reforestation		Total Federal Payments	
	Fiscal Year 1956-57	Total to Date	Fiscal Year 1956-57	Total to Date	Fiscal Year 1956-57	Total to Date
	\$	\$	\$	\$	\$	\$
Prince Edward Island..	—	—	15,573	69,603	15,573	69,603
Nova Scotia.....	62,369	296,629	1,882	5,014	64,251	301,643
New Brunswick.....	14,361	111,783	—	—	14,361	111,783
Ontario.....	240,493	1,542,564	126,617	572,220	367,110	2,114,784
Manitoba.....	18,199	306,745	12,096	42,190	30,295	348,935
Saskatchewan.....	24,674	228,163	2,929	11,813	27,603	239,976
Alberta.....	20,767	480,861	—	—	20,767	480,861
British Columbia.....	479,186	2,454,815	—	137,181	479,186	2,591,996
Total.....	860,049	5,421,560	159,097	838,021	1,019,146	6,259,581

9. Budworm Spraying—New Brunswick Distribution of Costs by Projects

(Federal Payments shown in Brackets)

Project	Prior to 1956-57 (\$1,614,271)	1956-57 (\$650,000) ¹	Total to Date (\$2,264,271)
	%	%	%
Airfield construction and maintenance....	19	4	14
Operational buildings.....	4	3	3
Aircraft loading facilities.....	5	12	7
Aircraft operation.....	28	36	31
Insecticide and assessment of spraying.....	34	31	33
Administration and other expenditures....	10	14	12
Total.....	100	100	100

¹ An additional sum of \$76,736 was paid out of the 1957-58 appropriation.

10. Disposal of Timber, Hay and Grazing Privileges, Camp Gagetown, N.B.

	Number Issued
PERMITS—	
Timber.....	147
Hay.....	13
Grazing.....	4
TOTAL.....	164
SALES—	
Timber.....	1
DUES RECEIVED—	
From disposal of timber.....	\$ 27,020
From hay and grazing permits.....	69
Sub-total.....	\$ 27,089
During 1956-57 from adjustments of 1955-56 permits.....	313
TOTAL.....	\$ 27,402
PRODUCTS SOLD—	
Sawlogs.....	1,370,360 ft. b. m.
Poles.....	2,536 pieces
Pulpwood.....	57 cords
Fuelwood.....	1,669 cords
Hay.....	163 tons
Grazing.....	16 head

11. Forest Products Laboratories

Under main headings, Research Work is shown separately hereunder for the Ottawa and Vancouver Laboratories. The work of the latter is mainly concerned with British Columbia and Alberta timbers and forest-based industries.

Timber Engineering

Ottawa

Continuing accumulation of basic data on the mechanical and physical properties of Canadian timbers. Basic research on the mechanics of a glued surface and on the behaviour of nailed joints. Studies on the strength and

efficiency of end joints for glued laminated construction. The development of designs of economical, nailed wooden trusses for house construction, and further investigation into the strength of wood stud walls.

Vancouver

Determination of the strength properties of western woods by means of mechanical tests; calculation of data relating to strength variability of species; strength tests on small specimens obtained from regular mill productions; taper and/or strength of poles, piling, and mining timbers; calculation of working stresses for structural timber; examination of the characteristics and occurrence of spiral grain.

Containers

Ottawa

Studies of more efficient methods of packing and shipping goods for National Defence and Agriculture. Investigations into the actual hazards to which containers are subjected in transit. Studies on sheathed containers incorporating various materials and fastening devices. Continuing investigations on the design and strength of containers manufactured from wood and wood-based products.

Veneers, Plywood, and Adhesives

Ottawa

Studies on veneer cutting and plywood manufacturing properties of white spruce and balsam poplar. Development of special veneer-knife profiles and lathe modifications to improve veneer quality. Investigations of characteristics and durability of wood adhesives. Causes and prevention of distortion in laminated wood products.

Vancouver

New theory of uniform plywood lay-ups analysed in respect to advantages and disadvantages; effect of drying temperatures on the gluing properties of Douglas fir veneers studied; work continued on the development of a technique for predicting the durability of plywood; microscopic examination of wood and bond failures continued.

Physics

Ottawa

Studies on the detection of inferior glue bonds in laminated wood products employing sonic vibration techniques. Evaluation of the dielectric properties of wood adhesives and studies on bonding wood laminates employing dielectric heating.

Wood Preservation

Ottawa

Continuation of the recording of durability data on test and service installations of posts, poles, railway ties, and pilings treated by different methods and with various preservatives. Treatment of green fence posts (jack pine, spruce, birch, poplar) by methods suitable for application on farms (diffusion, brushing), and service testing of posts so treated. Determination of preservative effectiveness of two compounds not used so far as wood preservatives, i.e., copper formate and copper abietate. Studies on the modification of the penetration of preservatives into wood by the use of swelling agents and of the effect of swelling agents on preservative efficiency. Evaluation of dip treatments for sash units by radioactive tracers.

Vancouver

Modification of mathematical formula derived from a series of experiments to better indicate the amount of condensate in relation to different variables at high temperatures; experimental treatment of western hemlock and Douglas fir and measurement of the degree of penetration of creosote; analysis of factors affecting penetration and retention; investigation of the effect of steaming on treatment; service records compiled relating to the life of treated and untreated marine installations in British Columbia coastal waters.

Pathology

Ottawa

Studies to determine the relative importance of the wood-decaying fungi isolated from decayed wood in buildings and in service outdoors, and their relation to the preservative treatment used. The inter-relation between the primary wood-decaying fungi and the other associated fungi isolated from wood decayed in service. The effect of common blue-staining and other wood-inhabiting fungi on the mechanical properties of wood. The effect of moulds and other antagonistic fungi in retarding development of decay in birch logs.

Vancouver

Identification of species and fungi; significance of the heartwood stains in lodgepole pine studied; relationships between the kiln-drying temperatures and durability of western red cedar checked; colour tests for delimiting the sap-heart line in western hemlock described; information in respect to cause and relative importance of the natural defects in Western Canadian softwoods assembled; durability of Douglas fir, western hemlock, and spruce plywood tested; fungicidal properties of a tropolone isolated from cedar heartwood studied.

Paint Coatings

Ottawa

Durability studies of protective coatings for plywoods and hardboards under various climatic conditions. Evaluation techniques for fire-retardant coatings. Study of the effect of species on the durability of exterior coatings. Research on various factors connected with blistering of paint such as species, pigments, moisture movement, temperature, etc. Studies on the paintability of creosoted wood.

Wood Chemistry

Ottawa

Evaluation of various types of mill residue for production of structural boards. Studies on the esterification of wood for modification of both chemical and physical properties. Research on chemical composition and pulping characteristics of tension wood (aspen). Isolation of lignin from wood with a minimum of chemical degradation.

Vancouver

Extensive analytical and degradative studies relating to a new naturally occurring tropolone in western red cedar; polyoxyphenols occurring in the water-extractable mixture of polyoxyphenols from cedar isolated and purified; analytical method for determining taxifolin in larch and Douglas fir completed; vanillin reduced to yield vanillyl alcohol in studies of the properties of oxy-coniferyl alcohol as related to the structure of lignin.

Microbiology

Ottawa

Studies continued on the microbiological breakdown of wood by rumen bacteria with the aim of producing usable products.

Milling

Ottawa

Data obtained on stresses in circular saw blades. Construction completed for a mill of new design using a travelling head-saw and stationary carriage. Investigations into the variables affecting the sawing of wood. Development of equipment to measure cutting torque on auxiliary sawmilling equipment. Studies on the use of sawmill waste for pulp. Comparison of volumes of waste from all types of manufacturing plants carried out in eleven Ontario counties. Studies on the briquetting of wood and bark. Continuation of work on grading of lumber.

Vancouver

Assessment of the value of so-called cull Douglas fir trees in the Kamloops Forest District by means of a lumber grade recovery study; a study of sawing times at a sawmill at which a whole-log barker was recently installed; study of balsam yields and defects at the Aleza Lake Forest Experiment Station in Northern British Columbia; data compiled in respect to volume and grade recovery from western larch butt logs.

Logging

Ottawa

Continuation of investigation into the effect of tree size and species on the various phases of logging and milling. Information obtained for the development of log grades for two Eastern Canadian hardwood species.

Vancouver

Breakage and other losses incurred during felling and bucking operations in the southern interior region of British Columbia analysed and described; data relating to time studies of felling, bucking, skidding, decking, and loading compiled; production rates for average hauling distances of 200 and 375 feet, respectively, determined for a tractor yarding operation.

Seasoning

Ottawa

Continuation of studies into the determination of equilibrium moisture content of lumber in different uses. Studies on effect of fluctuation of moisture content of seasoned wood on use; on kiln-drying of lumber and wood products with reference to conditions for development of mould; and on storage of lumber in paper and other wrappings. Annual course conducted for representatives of industry on improved drying techniques. Preparation of kiln-dried material as part of Canada's forestry exhibit at the Brussels World Fair, 1958.

Vancouver

Effect of high temperature kiln-drying on hygroscopicity studied; high temperature drying of Douglas fir and western hemlock continued; lumber kiln-dried and examined for defects after dipping in a chemical solution; schedule determined for tight-knotted western red cedar. Course in seasoning given to dry-kiln operators.

Wood Structure

Ottawa

Studies of effects of anatomical structure on wood properties and behaviour, especially its effect in bringing about dimensional changes of wood responding to changes in the moisture content. Studies on origin of separations (checks, shakes, etc.) in wood, absorption of preservatives by wood, formation of fractures under stress, and properties of special types of reaction-wood. Studies continued on fibre saturation point of normal wood and reaction-wood. Measurement of cell dimensions as aid in identifying timber species. Specimens added to reference collection of commercial wood species.

Vancouver

Sawdust samples—foreign woods and Canadian woods—identified microscopically; fractures and glue-line failures also studied microscopically.

Talks and Papers by F.P.L. Staff

- The Role of the F.P.L. in Establishing National Standards for Lumber and Other Forest Products, J. H. Jenkins—Research and Grading Committees, B.C. Lumber Manufacturers Assoc., Vancouver, B.C.
- The Need for Research in Future Developments of the Lumber Industry, J. H. Jenkins—Kiln Operators' Club, Nanaimo, B.C.
- High-Temperature Kiln-Drying, F. W. Guernsey—Kiln Operators' Club, Nanaimo, B.C.
- Improved Sawing Essential for Better Utilization, G. W. Andrews—Maritime Lumber Bureau, Halifax, N.S.
- Seasoning Difficulties, R. S. Millett—Singer Company's Engineering Society, Thurso, P.Q.
- The Determination of Dihydroquercetin, J. M. Barton—Northwest Regional Chemical Society, Seattle, Wash., U.S.A.
- An Analytical Method for Thujaplicins, J. A. F. Gardner—Northwest Regional Chemical Society, Seattle, Wash., U.S.A.
- Canadian Forestry Utilization Practices, J. H. Jenkins—Theme Address at the Annual Meeting, Canadian Institute of Forestry, Chicoutimi, P.Q.
- Utilization Trends, G. E. Bell—Panel Discussion, Annual Meeting, Canadian Institute of Forestry, Chicoutimi, P.Q.
- Utilization Developments, G. E. Bell and J. A. Doyle—Panel Discussion, Algonquin Section, Canadian Institute of Forestry, Pembroke, Ont.
- Is Spiral Grain a Normal Growth Pattern? P. L. Northcott—Vancouver Section Canadian Institute of Forestry, Vancouver, B.C.
- Effect of Physical Form of Raw Material in Fibreboard Manufacture, F. W. King and H. Schwartz—FAO Technical Conference on the Manufacture and Use of Fibreboards and Resin Bonded Particle Boards, Geneva, Switzerland.
- Insulation and Hard-Pressed Fibreboard Industry in Canada, F. W. King—FAO Technical Conference on the Manufacture and Use of Fibreboards and Resin Bonded Particle Boards, Geneva, Switzerland.
- Particle Board Industry in Canada, F. W. King—FAO Technical Conference on the Manufacture and Use of Fibreboards and Resin Bonded Particle Boards, Geneva, Switzerland.
- Chemistry and Wood Utilization, H. Schwartz and F. Bender—Panel Discussion, Eastern Canadian Section, Forest Products Research Society, Montreal, P.Q.
- Some Physical Factors Influencing the Effectiveness of Preservatives, T. S. McKnight—Eastern Canadian Section, Forest Products Research Society, Montreal, P.Q.
- Blistering of Paints on Various Wood Species, J. J. G. Veer—Eastern Canadian Section, Forest Products Research Society, Montreal, P.Q.
- Timber Engineering, D. E. Kennedy—Carleton College Engineering Students, Ottawa, Ont.
- Stress Grading of Timber, W. J. Smith—University of British Columbia Forestry Students, Vancouver, B.C.

The Gluing of Pretreated Wood, P. L. Northcott—Canadian Institute of Timber Construction, Vancouver, B.C.

Work of the F.P.L. of C., J. H. Jenkins—Manufacturers Forum, Spruce Bureau and Retail Bureau Meetings during Annual Convention, Canadian Lumbermen's Association, Montreal, P.Q.

Illustrated talks on Russia's forestry practices were delivered by J. H. Jenkins to fourteen miscellaneous groups, and on the work of the F.P.L., by J. A. Schryburt to the Association Forestière Québécoise Inc., Chicoutimi, P.Q.

Two 10-minute broadcasts—How the F.P.L. Can Help the Farmer, and A Visit to the U.S.S.R.—were recorded by J. H. Jenkins for use on the Esso Farm Reporter Program in Ontario.

APPENDIX F

(Appendix Natural History Branch and Human History Branch)

National Museum: Education Section

A primary aim of the National Museum is to provide the public with information on the natural and human history of Canada. The Museum's Education Section helps to accomplish this task through the medium of lectures, tours, television, correspondence, photographs, and the loan of visual teaching aids, such as films, film strips, slides, bird and mammal specimens, and Indian and Eskimo materials.

Adult Lectures in English

The annual Wednesday evening lecture series of the National Museum is a tradition of forty years standing and each season attracts a wide audience. Over 7,500 people attended the seventeen lectures which took place from October until April. Topics ranged through the fields of human and natural history, geography, travel, and exploration. Although the majority of lectures dealt with various aspects of this country, other subjects of current interest to Canadians were covered.

Prospects in Southwestern Asia—by George B. Cressey, M.A., Ph.D., L.H.D., Syracuse University.

Nature Preservation—by J. R. Dymond, O.B.E., M.A., D.Sc., F.R.S.C., University of Toronto.

The Atlantic Provinces—by J. M. Humphrey, Vancouver, B.C.

Scotland Afore Ye—by Neil Douglas, Meriden, Connecticut.

Meat-eaters of the Plant World—by R. D. Gibbs, M.Sc., Ph.D., F.R.S.C., F.L.S., McGill University.

The Vanishing Prairie—a motion picture.

The Story of Nickel—by Kenneth H. J. Clarke, B.A.Sc., N.D.C., International Nickel Company of Canada Ltd.

The Guinea Coast—by Harold A. Quinn, M.Sc., Ph.D., P.Eng., Geological Survey of Canada, Ottawa.

Paddling with the Explorers—by Eric W. Morse, M.A., Ottawa.

The Northern Andes—by Bogdan Zaborski, Ph.D., Associate Professor of Geography, McGill University.

Airborne Treasure Hunters—by L. W. Morley, M.A., Ph.D., Geological Survey of Canada, Ottawa.

How Small the World—by R. F. Legget, M.Eng., F.R.S.C., M.E.I.C., Director of Building Research, N.R.C., Ottawa.

Firth River Archæological Investigations—by R. S. MacNeish, B.A., M.A., Ph.D., Senior Archæologist, National Museum of Canada.

The Face of Japan—a film program.

Our Green Forests—by H. W. Beall, B.Sc.F., Federal Forestry Branch, Ottawa.

The Australian Scene—by C. T. Bissell, M.A., Ph.D., President, Carleton University, Ottawa.

Woods, Wildflowers, and Still Waters—by G. Marshall Bartman, Executive Secretary, Federation of Ontario Naturalists, Toronto.

Adult Lectures in French

Chansons et contes populaires du Canada—by Jacques Labrecque.

La Suisse et la diversité de ses cultures—by Dr. Victor Nef, Minister of Switzerland to Canada.

Le Folklore gaspésien—by Miss Carmen Roy, National Museum of Canada.

Children's Program

As with the Wednesday evening series, the Saturday morning program for children has become a tradition of long standing. This year the attendance reached a figure of over 16,000. There were two showings each Saturday morning at 9:45 and 11:00 a.m. from October to April.

Louisiana Story—a film classic by Robert Flaherty.

Adventures of Chico—a Mexican nature film.

Frogs! Frogs! Frogs!—a talk with films by Eric Mills, Carleton University.

Swiss Family Robinson—film.

The Last Wilderness—nature film.

Christmas for the Birds—a talk with films by Hugh Thompson, National Museum of Canada.

The Vanishing Prairie—film.

Tundra—film program on the Arctic.

The Overlanders—Driving Cattle in Australia.

The Land of the Golden Stool—by Dr. H. A. Quinn, Geological Survey of Canada.

Jacare—film on the Amazon River.

Film program on Britain.

Kingdom on the Waters—nature film.

Elephant Boy—film with story by Kipling.

Film program on Canada.

Forest Fire Fighting—by J. C. MacLeod, Federal Forestry Branch.

Water Wonders—Wonders of the deep in colour film.

Circus Boy—a J. Arthur Rank production for children.

Special Programs

As well as holding the regular series of lectures, the National Museum presented the following special programs:

Last Symbol of the Stone Age—by His Excellency Sir Douglas Copeland, High Commissioner for Australia.

The Living Museums of Scandinavia—by Mrs. Alice J. Turnham, Director, McGill University Museums.

A program of films on the Canadian North.

Reindeer breeding in Europe and Asia—by Dr. E. J. Lindgren, M.A., London, England.

Red Ochre and Rituals—by Dr. J. Norman Emerson, University of Toronto.

Canada in Colour—a series of films in colour on the Canadian Scene presented to Museum visitors during July and August from 3:00 to 4:00 p.m. (attendance 9,000).

Nanook of the North—a film on the life of the Eskimos held every Monday, Wednesday, Friday, and Sunday during March in conjunction with a special Eskimo exhibit.

Tours

During the fiscal year ended March 31, 1957, the Education Section provided guided tours of the exhibit halls for over 3,600 students and other group visitors from Ottawa and outside points. While the majority of tours were given for visitors from towns and cities in Ontario, the Museum welcomed organized groups from Quebec, New York State, and England. As well as students from schools and colleges, the groups consisted of members from such organizations as the Canadian Guards Regiment, University of Ottawa, Y.W.C.A. Summer Day Camp, St. Johns Military College, W.H. Rhodes Educational Trust Party, England, Sarah Lawrence University, New York, Vernon 4-H Club, Ottawa District Association for Retarded Children, and the Rotary Club's "Adventure in Citizenship" which brought senior high school students from across Canada. Daily one-hour tours were given during the summer months at 2:00 p.m. for Museum visitors.

Television

On October 2, the Museum opened its first program of the 1956 children's television series "Let's Go to the Museum." The programs which went on the air every Tuesday afternoon from 5:00 to 5:30 p.m. were of the quiz variety and were produced in the lecture hall of the Museum itself. Museum specialists and scientists acted as moderators, while the panel of three quiz experts were drawn for each week's show from the Museum's Macoun Junior Field Naturalists Club. The topics ranged through the fields of anthropology and natural history from Indian and Eskimo life to birds and mammals. Guest moderators for the series were Mr. W. E. Godfrey (birds), Dr. R. S. MacNeish (archæology), Dr. J. S. Bleakney (herpetology), Dr. L. S. Russell (mammals), Dr. E. L. Bousfield (sea-shore life), Dr. F. J. Alcock (National Museum), Mr. W. E. Taylor (Eskimos), Dr. W. Langston (dinosaurs), Mr. W. K. W. Baldwin (trees), Mrs. R. S. MacNeish (Indians), and Dr. Marius Barbeau and Mr. J. D. Darling (West Coast Indians). The shows proved popular throughout Canada with the Museum receiving over 27,500 letters from viewers in all parts of the country. Around fifteen hundred Ottawa school children had the opportunity to view the shows in the Museum lecture hall.

Lecture Hall

As in past years the lecture hall of the National Museum was made available to outside scientific and educational organizations. In this way 110 programs were held in the Museum. Organizations using the lecture hall included the Canadian Geographical Society, the Ottawa Citizen, the Civil Service Association of Ottawa, Ottawa Biologists and Anthropologists Group, American Society of Tool Engineers, Continental Club, Ottawa Public Schools, National Gallery, Ottawa Junior Music Group, Appalachian Discussion Group, Science Film Group, Ottawa Fish and Game Association, Logan Club, Ottawa Film Society, Mental Health Association, Canadian Association for Applied Spectroscopy, German Language Club of Ottawa, Community Planning Association, Canadian Diabetic Association, Geologists' Group of Ottawa, and the United Nations Association.

Lectures

BY THOMAS E. LEE:

The Archæology of the Ottawa River Valley and Manitoulin Island. Ottawa Valley Historical Society, Trinity Church, Pembroke.

Early Man in Ontario. School-teacher group, Corunna, Ont.

Early Man in Ontario. Industrialist and teacher group, Corunna, Ont.

Early Man in Ontario. Child Study Group, Corunna, Ont.

The Shéguiandah Site. Quebec Archæological Association, the McCord Museum, Montreal.

By WILLIAM E. TAYLOR:

- The Eskimo.* CBOT TV show "Let's Go to the Museum."
Eskimo Prehistory. Ysmenettes.
The Canadian Indian. Ottawa Friendship Society.

By R. S. MACNEISH:

- Canadian Explorations in Mexico.* Canadian Inter-American Association meeting at the Royal Ontario Museum, Toronto.
Recent Discoveries along the Firth River, Yukon Territory. Men's Luncheon Club, Y.M.C.A., Ottawa.
The Archæology in the Flin Flon Area. Radio speech for the Flin Flon radio station, Flin Flon, Man.
Archæology. CBOT TV show "Let's Go to the Museum."
The Domestication of Plants. Department of Geography, McGill University, Montreal.
Sequences in Northern Mexico. Anthropology Club, Harvard University, Cambridge, Mass.
Firth River Archæological Investigations. National Museum Lecture Series.
Problems of Archæological Identifications. National Science Foundation Meeting, Chicago, Ill.

By MARCEL RIOUX:

- A series of sixty lectures was given at the Ottawa University on various topics of cultural anthropology, from September 1956 to April 1957.
Le concept de folk-société et l'utilisation de l'histoire en anthropologie culturelle. Montreal, ACFAS.
Field Work in New Brunswick. CBC, Moncton.
Brève histoire de l'anthropologie. CBC, Montreal.
L'anthropologie contemporaine. CBC, Montreal.
L'anthropologie culturelle. CBC, Montreal.

By ASEN BALIKCI:

- Le Musée national du Canada.* L'Institut canadien-français, Ottawa.

By JACQUES ROUSSEAU:

- Le Musée de l'Homme.* Montmagny.
Ethnographical Research among the Naskapi. Department of Anthropology, University of Toronto.
The Anthropological Inquiry Technique among the Naskapi Indians. University of Toronto, Department of Anthropology.
 A series of 35 radio talks, CBC, French network, on the Indians of Northern Quebec, from April 1 to December 6, 1956.

Institutions Which Received Information or Specimens

Division of Archæology

American Museum of Natural History, New York City; Amerindian Institution, Phoenix, Ariz.; Archæological Association of Canada, Montreal; Arctic Institute of North America, Montreal; Brown University, Providence, R.I.; Cambridge University, England; Canadian Board on Geographical Names, Ottawa; Canadian Pacific Railway, Ottawa; Canada Post Office, Ottawa; Carnegie Museum, Pittsburgh, Penn.; Chicago Natural History Museum, Chicago, Ill.; City Museum, Vancouver, B.C.; Colgate University, Hamilton, N.Y.; Columbia

University, New York City; Dartmouth College, Hanover, N.H.; Denver Museum of Natural History, Denver, Col.; Dept. of Anthropology, University of Chicago, Chicago, Ill.; Dept. of Anthropology, McGill University, Montreal; Dept. of Anthropology, University of Mississippi; Dept. of Anthropology, University of New Brunswick; Dept. of Anthropology, University of Texas, Austin, Tex.; Dept. of Anthropology, University of Toronto, Toronto; Dept. of Geology and Dept. of Anthropology, University of British Columbia; Dept. of Geology, Yale University, New Haven, Conn.; Dept. of Geology, Wayne University, Detroit, Mich.; Dept. of Sociology, Carleton University, Ottawa; Dept. of Zoology, University of Arizona, Tucson, Ariz.; Dept. of Zoology, University of Montreal, Montreal; Dept. of Northern Affairs and National Resources (Arctic Division); Glenbow Foundation, Calgary, Alta.; Harvard University, Cambridge, Mass.; Historic Sites Branch, Ottawa; Instituto de Antropologia e Historia de Méjico, Mexico City; Instituto Interamerican, Denton, Texas; McCord Museum, McGill University, Montreal; Milwaukee Public Museum, Wis.; Mountain Sanatorium, Hamilton, Ont.; Museum of Archaeology, Tokyo, Japan; National Film Board, Ottawa; National Gallery of Canada, Ottawa; National Museum, Copenhagen, Denmark; National Parks Branch, Ottawa; New Brunswick Museum, Saint John, N.B.; New York State Museum, Albany, N.Y.; New York Archaeological Foundation, Orinda, Cal.; Ontario Archaeological Society, Toronto; Ontario Hydro Commission, Toronto; Oxford University, England; Pan-American Institute of Geography and History, Washington, D.C.; Redpath Museum, McGill University, Montreal; Robert S. Peabody Foundation for Archaeology, Andover, Mass.; Rochester Museum of Arts and Sciences, Rochester, N.Y.; Royal Ontario Museum, Toronto; Saskatchewan Provincial Museum, Regina, Sask.; Smithsonian Institution, Washington, D.C.; St. Louis Botanical Gardens, St. Louis, Miss.; The Geological Department of John Hopkins University, Baltimore, Md.; The Ottawa Valley Historical Society, Ottawa; Tourist Bureau, Miami, Fla.; University of Michigan, Ann Arbor, Mich.; University of Pennsylvania, Philadelphia, Penn.; University of Western Ontario, London, Ont.; University of Wisconsin, Madison, Wis.; Urania Berlin, Berlin, Germany; United States Department of Agriculture, La Jolla, Calif.; Wenner-Gren Foundation for Anthropological Research, New York City.

Division of Ethnology

Académie des Arts, Sciences, et Lettres, Lyon, France; Académie canadienne-française, Montreal; American Men of Science (Encyclopædia), Lancaster, Pa.; Archives of Society for the Propagation of the Gospel, London, England; Arctic Institute of North America, Montreal; American Museum of Natural History, New York City; The American Oxonian, Wilson College, Chambersburg, Pa.; Canadian Association for Adult Education, Toronto; Canadian Board on Geographic Names, Ottawa; Canadian Broadcasting Corporation, Montreal; Canadian Citizenship Branch, Ottawa; Canadian Handicrafts Guild, Montreal; Canadian National Railways System, Montreal; Canadian Pulp and Paper Association, Montreal; Canadian Social Science Research Council, New York City; Carleton University, Ottawa; Christ Church Cathedral, Dublin, Ireland; Columbia Records of Canada Ltd., New York City; Composers, Authors, and Publishers Association, Toronto; Conseil de la Vie française, Québec; Conservatoire national de musique et d'art dramatique, Lyon, France; Consolidated Paper Corp. Ltd., Montreal; Crawley Films Ltd., Ottawa; Canadian Geographical Society, Ottawa; Clarendon Press, Oxford, England; Congress of Americanists, Copenhagen, Denmark; Department of Citizenship and Immigration, Ottawa; Department of External Affairs, Ottawa; Department of National Defence, Ottawa; Department of Protestant Education, Quebec City; Detroit Historical Museum, Detroit, Mich.; Denver Art Museum, Denver, Colo.; Encyclopædia of Canada, Ottawa; Eldorado Mining and Refining Limited, Eldorado P.O., Sask.; Ethnic Folkways Library, New York City; Fathers of the Holy Cross, Moncton, N.B.; Fathers of the Holy Ghost, Montreal; First Presbyterian Church, St. Helena, Calif.; Folkways Records and Service Corp., New York City; French-Canadian Protestant Forum, Ottawa; Gillies Bros. & Co. Ltd., Braeside, Ont.; Grolier Society Inc.,

New York City; Grolier Society of Canada Limited, Ottawa; Holy Cross Hospital, Drummondville, Que.; Legislative Assembly, Quebec City; Hudson's Bay Company, Winnipeg; Indian Affairs Branch, Ottawa; Institut Canadien-français, Ottawa; Institute for Research in Social Science, University of North Carolina, Chapel Hill, N.C.; International Folk Music Council, London, England; Jeunesses Musicales, Montreal; Journal of American Folklore, Philadelphia, Pa.; Kingston University, Kingston; Laval University, Quebec City; Librairie Hachette, Paris, France; L'Ordre de Bon Temps, Montreal; Michigan Folklore Society, Ann Arbor, Mich.; Michigan State College, East Lansing, Mich.; Montevideo Museum, Montevideo, Uruguay; Montreal University, Montreal; Musée national des arts et traditions populaires, Paris, France; National Film Board, Ottawa and Montreal; National Folk Festival by St. Louis Globe-Democrat, St. Louis, Mo.; Native Community Development Bureau, Ottawa; National Gallery of Canada, Ottawa; Oblate Fathers, Ottawa; Oxford University, Oxford, England; Pitt-Rivers Museum, Oxford, England; Public Archives, Ottawa; Peabody Museum, Salem, Mass.; R.A.F. College of Arms, London, England; R.C.A.F. College of Arms, Ottawa; R.C.A.F. Headquarters—Air Technical Services, Ottawa; Research Centre for Amerindian Anthropology, Ottawa; Royal Ontario Museum, Toronto; Royal Society of Canada, Ottawa; Smith College, Northampton, Mass.; Société des écrivains canadiens, Montreal; La Société Historique du Saguenay, Chicoutimi; University of Ottawa, Ottawa; University of Toronto, Toronto; University Museum, University of Pennsylvania, Philadelphia, Pa.; University College of North Staffordshire, Keele, Staffordshire, England; Wenner-Gren Foundation for Anthropological Research, New York City.

APPENDIX G

LIST OF PUBLICATIONS ISSUED 1956-57

National Parks Branch

Canadian Wildlife Service

Wildlife Management Bulletins

Series 3, Number 5. *Studies of Lake Trout and Common Whitefish in Waterton Lakes, Waterton Lakes National Park, Alberta.* J. P. Cuerrier and F. H. Schultz.

Technical Articles

- An Investigation of Ticks as Disease Vectors in Banff National Park, Alberta.* A. W. F. Banfield. *Can. J. Zool.* 34: 417-423. 1956.
- Pairing Display and Spring and Summer Flights of the Mallard.* A. Dzubin. *Blue Jay* 151: 10-13. 1957.
- Dogs in the Duck Factory.* J. B. Gollop. *C. I. L. Oval*, Oct., pp. 8-11. 1956.
- Records of Two Microtine Rodents from the Quebec Tundra.* A. W. F. Banfield. *Can. Field-Nat.* 70 (2): 99. 1956.
- The Polar Bear in Its Protection.* A. G. Loughrey. *Oryx* 3 (5): 233-239. 1956.
- Research—a Hope for the Future?* D. A. Munro. *Proc. 46th Convention Int. Assoc. Game, Fish and Conser. Commissioners.* Pp. 167-170. 1956.
- Some Aspects of Conservation and Wildlife Management.* V. E. F. Solman. *Eng. J.* 30 (5): 1-5. 1956.
- Gross Composition of Musk-ox Milk.* J. S. Tener. *Can. J. Zool.* 34: 569-571. 1956.
- Transfer of Anæsthetized Pike and Yellow Walleye.* F. H. Schultz. *Can. Fish Culturist* 18: 1-5. 1956.
- Book review: *The Deer of North America.* A. W. F. Banfield. *J. Wildlife Mgmt.* 21 (1): 105-106. 1957.
- In the Transactions of the Twenty-first North American Wildlife Conference 1956:
- Canada's Place on the Team.* W. Winston Mair. Pp. 84-90.
- The Use of Retrievers in Banding Flightless Young Mallards.* J. B. Gollop. Pp. 239-248.
- Creel Censuses.* J. P. Cuerrier. Pp. 275-281.
- In the Proceedings of the Thirty-sixth Annual Conference of the Western Association of State Game and Fish Commissioners, 1956:
- Toward an Ecological Conscience.* W. Winston Mair. Pp. 14-17.
- Waterfowl in the Developing West.* D. A. Munro. Pp. 45-48.

Reports Published Jointly with the U.S. Fish and Wildlife Service

- Waterfowl Populations and Breeding Conditions, Summer, 1955.* Special Scientific Report—Wildlife No. 30. 1956.
- Investigations of Woodcock, Snipe, and Rails in 1956.* Special Scientific Report—Wildlife No. 34. 1957.

Pamphlets Reprinted

- Maisons d'oiseaux et leurs occupants.* Translation of *Bird Houses and Their Occupants* (Seventh Edition).
- Hunters and Hunted.* (Second Edition).

Forestry Branch**Bulletins and Periodicals**

- Bulletin 61. *Native Trees of Canada* (5th Edition).
 Bulletin 106, Revised Edition 1957. *Forest and Forest Products Statistics, Canada*.
Canada's Forests, 1951-1955 (Report to the Seventh British Commonwealth Forestry Conference).
Annual Report on Active Research Projects.
Forest Fire Losses in Canada, 1955.
1956 Forest Fire Danger Tables.
Forest Fire Protection Abstracts, Vol. VI, No. 2.
 Cumulative Index, Vols. I to VI. *Forest Fire Protection Abstracts*.

Technical Notes

- No. 36. *The Effect of Certain Vegetation Eradicators on the Inflammability of Various Materials*. E. J. Ward.
 No. 37. *The Use of Chemicals to Release White Pine Reproduction*. E. S. Atkins.
 No. 38. *Susceptibility of Certain Trees of Eastern Ontario to Basal Bark Sprays*. E. S. Atkins.
 No. 39. *The Chemical Control of Density in Young Stagnating Stands of Lodgepole Pine*. D. I. Crossley.
 No. 40. *Balsam Fir and White Spruce Reproduction on the Green River Watershed*. A. B. Vincent.
 No. 41. *The Effect of Crown Cover and Slash Density on the Release of Seed from Slash Borne Lodgepole Pine Cones*. D. I. Crossley.
 No. 42. *Reproduction and Growth in Cut-over Black Spruce Swamps at the Petawawa Forest Experiment Station*. A. B. Berry and J. L. Farrar.
 No. 43. *An Ecological Approach to Tolerant Hardwood Silviculture*. J. M. Jarvis.
 No. 44. *Survival of White Spruce Seedlings Resulting from Scarification in a Partially Cut Mixedwood Stand*. J. Quaitie.
 No. 45. *The Ecology of Lodgepole Pine in Alberta and its Role in Forest Succession*. K. W. Horton.
 No. 46. *Air Photo Overlays*. W. U. Hardy.
 No. 47. *The Translocation of Minerals in Trees*. D. A. Fraser.
 No. 48. *Phenology of Rootstocks and Grafts in a Timing Experiment with Autumn and Winter Grafting of Norway and White Spruce*. M. J. Holst.
 No. 49. *Experimental Seeding of Black Spruce on Cormack Burn, Newfoundland*. W. A. Dickson.

Miscellaneous

- No. 4. *Forest Fire Protection* (Revised).
Forestry Lessons (5th Edition).
Canada's Forests, 1957. (French edition: *Les Forêts du Canada, 1957*.)

Articles

- Notes on the Norway Spruce-White Pine Weevil Relationship in the Adirondacks.* M. J. Holst. Alumni News, Forest Ranger School, Wanakena, N.Y., January 1956.
- Mulching and Screening of White Spruce Seed Spots on Cut-over Lands.* J. W. McLeod. Woodlands Review, Pulp and Paper Magazine of Canada, May 1956.
- Forest Fire Control Plans.* J. C. MacLeod. Forestry Chronicle, Vol. 32, No. 2, June 1956.
- Uses of Undergrowth Plant Species in Forestry.* J. S. Rowe. Ecology, Vol. 37, No. 3, July 1956.
- Classification of Site for Forest Management.* J. S. Rowe. 12th Congress I.U.F.R.O., July 1956.
- Regeneration of Red and White Pine in the Great Lakes-St. Lawrence Forest Region.* K. T. Logan and W. G. E. Brown. 12th Congress, I.U.F.R.O., July 1956.
- Empirical Stand Density Yield Tables for the Boreal Forest in Eastern Canada.* G. H. D. Bedell and D. W. MacLean. 12th Congress, I.U.F.R.O., July 1956.
- Living With Rapid Site Degradation.* D. E. Nickerson. Forestry Chronicle, Vol. 32, No. 3, September 1956.
- Ecological Studies of Forest Trees at Chalk River, Ontario, Canada. II. Ecological Conditions and Radial Increment.* D. A. Fraser. Ecology, Vol. 37, No. 4, October 1956.
- Site Classification as Applied to Silviculture and Management.* O. L. Loucks. Annual Report, Maritime Section, C.I.F. November 1956.
- The Classification of Site and Its Role in Forest Operations.* W. G. E. Brown. Annual Report, Maritime Section, C.I.F. November 1956.
- The Future of Eastern White Pine in Canada.* G. H. D. Bedell. Forestry Chronicle, Vol. 33, No. 1, March 1957.
- The Effectiveness of Ammonium Sulphamate for Killing Defective Tolerant Hardwoods.* J. M. Jarvis. Forestry Chronicle, Vol. 33, No. 1, March 1957.
- Unpopular Species and Their Increased Use in the Maritimes.* H. D. Heaney. Forestry Chronicle, Vol. 33, No. 1, March 1957.
- The Rockland Red Pine Plantation, 1956.* W. M. Stiell. Timber of Canada, March 1957.

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- Forest Fire Control Plans.* J. C. MacLeod. Forestry Chronicle, Vol. 32, No. 2, June 1956.
- Uses of Undergrowth Plant Species in Forestry.* J. S. Rowe. Ecology, Vol. 37, No. 3, July 1956.

Mimeographed Reports (limited distribution)

- Empirical Stand Density Yield Surveys, Extent of Sampling in Ontario and Quebec.* D. W. MacLean and W. G. E. Brown.
- Some Aspects of Black Spruce Reproduction in the Central Boreal Forest Region of Manitoba.* H. G. Johnson.
- Photographing Soil Pits.* J. S. Rowe.
- Growth and Yield of Red and White Pine.* R. J. McCormack.
- Strip and Spaced Thinning in Overstocked Jack Pine and Black Spruce Stands.* J. S. Jameson.
- Notes on Browsing Damage.* R. F. Ackerman, J. H. Cayford, J. M. Jarvis, R. J. McCormack, A. B. Berry, J. S. Rowe.

- A Test of Punch Card and Sense Marking Techniques for Permanent Sample Plot Measurement and Analyses.* A. B. Berry.
- Summaries of Area, Volume, and Increment for Individual Map Sheets, Avalon Peninsula, Newfoundland.* W. C. Wilton.
- The Black River Ecological Area, Fourth Ecological Report.* D. W. MacLean.
- The Aspen-birch-spruce-fir Type in the Boreal Forest Region of Ontario.* D. W. MacLean.
- Standard Volume Tables of White Spruce on Alluvial Soils in the Wood Buffalo National Park.* G. B. Sully, F. W. Kippen, T. G. Honer.

Forest Products Laboratories of Canada

Bulletins and Technical Notes

- Bulletin 101. *Utilisation de la sciure de bois comme combustible dans l'est du Canada.*
- Bulletin 107. *Le traitement préservateur des poteaux de clôture par des procédés sans pression.*
- Bulletin 115. *Les déchets de coupe dans l'est du Canada.* J. A. Doyle.
- Tech. Note 1. *Decay and Discolorations in Poplar Pulpwood.* E. A. Atwell.
- Tech. Note 2. *High-temperature Drying of Eastern Canadian Softwoods.* Drying Guide. J. L. Ladell.

Technical Reports

- Treatment of Fence Posts of Non-Durable Species with Modern Water-borne Preservatives by a Butt Diffusion Method.* J. Krzyzewski.
- Moisture Content of Lumber, Its Determination and Effect on Weight.* (Revised edition.)
- Wooden Scows—Some Factors Affecting Their Durability.* H. W. Eades. (Revised edition.)
- Factors Affecting Lumber Recovery from Spruce in the Prince George Area of B.C.* C. F. McBride.
- Penetration and Exudation of Oil in Sections of Pine Poles Treated with Creosote-Pentachlorophenol Mixtures.* H. P. Sedziak.
- A review of Canadian Forestry Utilization Practices.* J. H. Jenkins.
- Program of Work—June 1956 to May 1957.*
- List of Publications of F.P.L. of Canada.*

Reprints of Articles and Papers

- Microbiological Utilization of Cellulose and Wood.* D. W. Stranks. Reprinted from Canadian Journal of Microbiology, February 1956.
- Progress in the Utilization of Sawmill Waste for Pulpwood.* J. H. Jenkins. Reprinted from Pulp and Paper Magazine of Canada, April 1956.
- Some Variables Affecting the Shrinkage of Western Hemlock.* W. C. Fountain and F. W. Guernsey. Reprinted from Forest Products Journal, April 1956.
- Thickness and Density of Bark—Trends of Variation for Six Pulpwood Species.* J. D. Hale. Reprinted from Pulp and Paper Magazine of Canada, December 1955.
- Variation Throughout the Year in Moisture Content of Some Wooden Building Components.* E. Brooks. Reprinted from Timber of Canada, April 1956.
- Analytical Method for Thujaaplicins.* H. MacLean and J. A. F. Gardner. Reprinted from Analytical Chemistry, April 1956.
- White Elm Veneer and Plywood.* A. O. Feihl. Reprinted from Timber of Canada, September 1956.

- The Efficiency of Scarf Joints.* A. P. Jessome. Reprinted from Canadian Woodworker, June 1956.
- Forest Products Laboratories of Canada.* Reprinted from Canadian Woodworker, October 1956.
- Report of a Visit to Russia's Forest Industries.* J. H. Jenkins. Reprinted from Canada Lumberman, November 1956.
- High-temperature Drying of Yellow Birch.* J. L. Ladell. Reprinted from Forest Products Journal, November 1956.
- Cutting White Spruce Veneers for Plywood.* A. O. Feihl. Reprinted from Canadian Woodworker, November 1956.
- Worm Holes in Jack Pine.* D. E. Kennedy. Reprinted from Timber of Canada, January 1957.
- Adjustable Sawmilling Gauge.* G. W. Andrews. January 1957.
- Logging Waste Survey in Alberta.* G. R. W. Nixon and R. W. Kennedy. Reprinted from Prairie Lumberman, November 1956.
- Distribution of Fungicidal Extractives in Western Red Cedar Heartwood.* H. MacLean and J. A. F. Gardner. Reprinted from Forest Products Journal, December 1956.

Magazine Articles Additional to Those Listed under Reprints

- Canada Reports on Board Research.* J. H. Jenkins. The Lumberman (Seattle), March 1956.
- How to Obtain and Maintain Accuracy of Cutting.* Part 3 of "Handbook for Small Sawmill Operation." J. C. Compton, U.S. Forest Service and G. E. Bell, Forest Products Journal, June 1956.
- Tenderizing and Loose Cutting of Veneers.* R. W. Peterson and A. O. Feihl, Canadian Woodworker, July 1956.
- Problems of Timber Engineering.* D. E. Kennedy. Forest Products Journal, July 1956.
- A Scientific Approach to the Design of Wooden Containers and the Design and Use of Pallets.* J. M. Rudnicki, Australian Timber Journal, July 1956.
- Sticker Losses.* W. C. Fountain. B. C. Lumberman, September 1956.
- The Work of Canadian Government Agencies in Relation to the Forest Products Industries—Panel Discussion.* J. H. Jenkins and H. Schwartz. Forest Products Journal, December 1956.
- The Strength of Fire-Killed Timber.* W. J. Smith. Australian Timber Journal, August 1956.
- Canada's Forestry Utilization Practices.* J. H. Jenkins. B.C. Lumberman, October, 1956, Timber of Canada, December, 1956, and Timber Trades Journal (Great Britain), December 1956.
- Forest Utilization.* J. H. Jenkins. Timber Trades Journal (Great Britain), December 1956.
- A Review of Canadian Forestry Utilization Practices.* J. H. Jenkins, Forestry Chronicle, December, 1956, and Pulp and Paper Magazine of Canada, January 1957.
- Adjustable Sawmill Gauge Reduces Waste.* G. W. Andrews. B.C. Lumberman, March 1957.

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- No. 111. *St. Lawrence and Southern Hudson Bay Drainage, Climatic Years 1951-52 and 1952-53.*

No. 113. *Arctic and Western Hudson Bay Drainage, Climatic Years 1951-52 and 1952-53.*

No. 116. *Atlantic Drainage, Climatic Years 1952-53 and 1953-54.*

Mimeographed Reports

Hydro-Electric Progress in Canada.

Water Power Resources of Canada.

Natural History Branch of the National Museum

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APPENDIX II

Annual Report of the Commissioner of the Northwest Territories — 1956 - 57

Commissioner—GORDON ROBERTSON

Council

The Council of the Northwest Territories met twice, once at the site of the new town of Aklavik (East 3) from August 23 to 31, 1956, and once at Ottawa from January 14 to 23, 1957. The session at East 3 was significant for several reasons. It afforded the members of the Council a unique opportunity to visit the people of the delta region of the Mackenzie River and enabled them to see the progress being made on the new town at East 3. It was also the first meeting of the Council to be held north of the Arctic Circle. The Mace, which had been presented to the Council in January, 1956, by His Excellency the Governor General, was used for the first time at a session in the North. It was placed on display at both Yellowknife and the old town of Aklavik, as well as at East 3, and attracted widespread attention.

Several topics of importance were raised during the debates on the Commissioner's opening address. At Aklavik, those of greatest local concern were the caribou situation and the question of liquor privileges for Indians and Eskimos. These points were raised again at the January session when legislation was passed to permit Indians and Eskimos to consume beer on licensed premises, subject to proclamation of section 95 (2) of the Indian Act. Some further matters discussed during the meeting in Ottawa were the Great Slave Lake fishing industry, the fur export tax, and the fluoridation of the water supply at Fort Smith. Altogether, there were twenty-two bills passed at both sessions, twelve at Aklavik and ten at Ottawa, most of them being amendments to existing legislation.

In January, Mr. Frank Carmichael, the elected member for the Mackenzie Delta constituency, resigned for personal reasons. Mr. Carmichael first became a member of the Council in 1951. Because of his knowledge of the north and its people, he has contributed greatly to the Council's deliberations.

Economic Activity

The economic outlook for the Northwest Territories continued to show slight improvement in 1956, though the narrow base of industrial activity still presents a considerable problem.

Government construction programs in Yellowknife, Fort Smith, Aklavik, Frobisher Bay, and other centres, along with the construction of the Distant Early Warning line, continued to provide opportunities for local employment, thereby permitting residents to supplement their incomes. However, these projects offer no long term solution to the problem of employment for persons who formerly depended on hunting and trapping for a livelihood, except for the limited numbers who will find permanent employment in connection with the operation of the DEW Line. The Territories are still in need of additional basic industries. The plywood development in the Fort Smith area, which began to take shape in 1956, promises to offer permanent employment for a number of residents south of Great Slave Lake in the Mackenzie District.

In the mining industry, the production of gold continues to suffer from the opposing pressures of a fixed sale price and increasing costs. The outlook for uranium showed considerable improvement in 1956 as indications became stronger that peaceful uses of this mineral will create an increasing demand

for it in the years to come. Exploration for base metals continued at a very active rate, and it is most encouraging to note that in 1956 interest in these activities extended to the islands in Hudson Bay, and James Bay, to the lands bordering both sides of Hudson Bay and to the area south of Coronation Gulf. A base metal mine employing about 90 persons, of whom about 25 are Eskimo, was ready to go into production at Rankin Inlet at the end of the year, and all indications are that exploration activities in the District of Keewatin and the Arctic Islands will reach a new peak in 1957. Every effort is being made to encourage the employment of Eskimo people in the areas affected.

If the current level of activity is sustained, the outlook is good for the establishment of base metal mines which would bolster the economy of the Territories and advance it a step toward the diversity it requires. However, even if the present exploration work is successful, the problems of transportation will remain a major factor in deciding whether or not any base metal operation is economically feasible.

Preliminary figures for the value of mineral production in 1956, including the value of pitchblende, totalled \$22,949,122 as against \$25,594,549 in 1955. Gold production in 1956 increased to \$12,145,094 from a total of \$11,092,001 in 1955, while pitchblende declined to \$9,394,000 compared with \$13,248,198 in 1955. Production of silver, crude petroleum, and natural gas showed increases.

The number of mining claims staked in the Northwest Territories during 1956 totalled more than 10,000 including 1,872 claims in the Arctic and Hudson Bay Mining District.

A further increase took place in exploration for oil and gas. Activity in this field is mainly directed to the southwest corner of the Mackenzie District. At March 31, 1957, there were 192 active Oil and Gas Permits in effect, with a total of 10,249,001 acres under permit.

The Great Slave Lake fishery yielded 6,600,954 pounds of white-fish and lake trout during 1956-57. This was a decrease of half a million pounds from the 1955-56 catch and is well below the quota of nine million pounds. Figures for the marketed value of the 1956-57 catch were not available when this report was prepared.

The fur trapping industry in the Territories, after showing a considerable increase in 1954-55, declined again in the crop year 1955-56. The number of pelts taken during 1955-56 was 366,000 valued at \$806,000, which compares with 478,000 for 1954-55 with a value of \$1,167,000. The fur trade continues in a depressed condition with no present indication of revival. It was expected that the catch of white fox would be reduced as this species reached the peak of its four-year cycle in 1954-55. Muskrat and beaver also declined considerably owing principally to poor prices and the fact that many trappers did not fully utilize their areas.

Workmen's Compensation

The Workmen's Compensation plan continued to operate successfully, and the number of insured employers increased to 255 from 209 in 1955. Accidents reported in 1956 showed an increase of 54 per cent over the previous year, a large part of which was attributable to DEW line employment.

The figures for the last two years are as follows:

	1955	1956
Non-compensable accidents	432	824
Compensable accidents	485	626
Compensation payments	\$ 89,827	\$266,435.28
Medical and hospital payments	\$ 54,427	\$121,152.59

The Alberta Workmen's Compensation Board continued to perform the functions of Referee under the Workmen's Compensation Ordinance.

Health

At the January session of the Council a new Public Health Ordinance was passed, which is to come into force upon Order of the Commissioner. This Ordinance consolidates and brings up to date the present Pollution of Running Streams Ordinance, Public Health Ordinance, Sanitary Control Ordinance, and Venereal Diseases Prevention Ordinance. Regulations to be promulgated under the new Ordinance governing communicable diseases, sanitation in camps, general sanitation, and sanitation in eating and drinking places are being drafted in consultation with specialists of the Department of National Health and Welfare, and it is anticipated that when these are ready an order will be issued to bring the new Ordinance into force.

Commencing April 1, the free cancer diagnosis and treatment program was extended to include non-indigents as well as indigents, and during the year 17 residents received assistance under this program.

The intensive tuberculosis prevention and treatment program, which has been in operation for a number of years, showed gratifying results. During 1956 there were 12,139 patient days spent in hospital by tuberculosis patients, other than Indians and Eskimos, compared with 16,922 in 1955, a decrease of almost 29 per cent.

Under the National Health Grants program, public health training was provided for three graduate nurses who will be employed in the Territories following completion of their course. Free dental services were provided for children of school age in Yellowknife, and the program for the treatment and rehabilitation of crippled children was continued. A tuberculosis case finding survey was again carried out in the summer months in conjunction with the Department of National Health and Welfare, and an eyesight survey was conducted in Yellowknife. Financial assistance was given to the nursing aid school at Fort Smith and to a research program for the study of parasitic diseases in northern man.

At the January session of the Council, provision was made for a grant equivalent to one-third of the cost of a new nursing station at Hay River, or \$26,000, whichever is the lesser. Provision was also made for the issue of comforts to patients in hospitals where auxiliary services are non-existent.

Welfare

Relief assistance was provided for indigents as required. During the year there was some increase in the number of recipients of Old Age Assistance and blind persons allowance, and the first applicants under the new disabled persons allowance program were received.

At March 31, 1957, there were 102 recipients of Old Age Assistance compared to 93 at the same time in the previous year. Seventy-eight of these were Treaty Indians, 17 were Eskimos, and seven were other than Indian and Eskimo. There were 25 recipients of blind persons allowance at March 31, 1957, as compared with 18 at March 31, 1956. Twelve of these were Indians, 12 were Eskimo, and one was other than Indian and Eskimo. Seven applications for disabled persons allowance were received, of which four were rejected on medical grounds. Three Eskimo applications were approved.

A welfare officer was appointed at Aklavik in the summer of 1956. This officer's duties include responsibility for welfare services for all races living in the Mackenzie Delta.

With the kind co-operation of the provincial officials of Alberta, an agreement was concluded with the Department of Public Welfare of that province whereby children declared to be in need of protection under the Protection of Children Ordinance may be legally transferred to the care and custody of the provincial welfare authorities. In all cases of children apprehended under

this Ordinance, every effort is made to find suitable foster homes in the Territories. However, this is not always possible, and the arrangement with the Province of Alberta will ensure that the care of children sent to that province is under the direction of trained welfare personnel.

Education

Day schools were operated by the Department of Northern Affairs and National Resources at 18 centres where there were pupils of other than Indian or Eskimo status. These centres were Aklavik, Fort Simpson, Fort Good Hope, Coppermine, Chesterfield Inlet, Cape Dorset, Hay River, Fort Smith, Fort Franklin, Fort Norman, Fort Liard, Rocher River, Arctic Red River, Fort McPherson, Rae, Fort Resolution, the new town of Aklavik, and Reindeer Station. The Territorial Government reimbursed the Department on a per pupil cost basis for the education of children who are its responsibility. In addition to their normal teaching duties, the welfare teachers who staffed the federal schools give leadership to local activities designed to effect improvements in community well-being.

Yellowknife Public School District No. 1 operated a 14-classroom elementary and high school. Yellowknife Roman Catholic School District No. 2 operated a 5-classroom school. Grants were made to both school districts. On March 31, 1956, there were 279 pupils enrolled in Grades I to XII in the public school, and 132 pupils in Grades I to XI were enrolled in the separate school.

At Port Radium a school was operated jointly by Eldorado Mining and Refining Limited and the Territorial Government. At the Discovery Yellowknife Mine, a school was operated by the mine management, assisted by a grant from the Territorial Government. At Fort Smith, in addition to the local federal day school, a day school was operated by the Roman Catholic Mission. Residential schools were operated by the Anglican Church at Aklavik and by the Roman Catholic Church at Fort Resolution, Fort Providence, and Aklavik. Two hundred and thirty-two children of other than Indian or Eskimo status attended the day and residential schools operated by Mission authorities.

An annual scholarship of \$1,200 was provided by the Territorial Government to the student obtaining the highest mark in the final Grade XII examinations, on the condition that continuation of such scholarship beyond the first year is subject to satisfactory progress being made by the student. Under this scholarship plan two student residents of the Northwest Territories are at present attending the University of Alberta.

Further progress was made with the new schools and hostels for Fort Smith, Fort McPherson, Yellowknife, and Aklavik. It is expected that the new school and hostel at Fort Smith will be ready for occupancy by the autumn of 1957.

Research and study are continuing with the object of devising a special curriculum for children in the Territories. In the preparation of the curriculum, it is proposed to seek the co-operation and advice of local residents with long experience in the north as well as that of technical and professional people. The curriculum will be designed to prepare children for the types of employment that are likely to be available in the Territories, as well as for life in the native habitat.

Equipment and supplies were provided for a number of schools to assist them in their manual training and physical fitness programs. Shipments of films were made on a monthly basis to settlements in the Mackenzie District, and special shipments of films were made to other settlements in the Territories. School broadcast programs were featured over Mackenzie District radio stations.

The Vocational Training program designed to prepare trainees for gainful employment was expanded. Some 47 persons either completed their training or were continuing training. Several received their training outside the Territories at such centres as Edmonton, Calgary, Winnipeg, and Montreal.

There are a growing number of applicants who are desirous of receiving training through the medium of local training programs in carpentry and electricity. The local training programs are conducted within the Territories at such points as Aklavik and Fort Smith.

Game

In view of the continuing decline of the caribou population, expenditures for predator control programs were increased. The poisoning program was expanded, and three professional hunters were employed. Funds were provided for special wolf hunts in May, June and July, 1957, and for a contribution to an 18-month special Federal-Provincial caribou research project to be commenced in the spring of 1957. The final results of the predator control program conducted during the winter of 1956-57 are not expected to be as good as for the previous year because of the scarcity of caribou on their normal winter ranges in the Mackenzie District.

Statistics indicating a decline in the fur take are set out in the section of this report under the heading "Economic Activity".

Municipal Affairs

The completion of arrangements by a private firm to construct a plywood plant at Fort Fitzgerald, Alberta, with employees' housing in Fort Smith, N.W.T., coupled with other activities in the area made it necessary to commence planning for an immediate and orderly expansion of the latter settlement and for the construction of a new water and sewer system. Specialists of the Central Mortgage and Housing Corporation and of the Department of Public Works were called upon for advice, and a great deal of preliminary work was carried out. If the developments which can now be foreseen at Fort Smith take place, it seems likely that within the next few years the community will be made an incorporated municipal district.

At the new site of Aklavik, roads, employees' housing, and service buildings were constructed by the Department of Northern Affairs and National Resources preparatory to the commencement of major construction projects in the summer of 1957. The Federal Government approved in principle the method of compensating residents of old Aklavik for their property, and Federal officials assessed for compensation purposes all properties in the community. In many cases negotiations with the property owners were completed.

Real property taxes were levied for the first time in the Local Improvement Districts of Fort Smith and Fort Simpson.

Finances

Territorial revenues for the fiscal year totalled \$1,893,932.96 as compared to \$1,557,623.42 in the previous year. The principal revenues were as follows:

(a) Liquor receipts	\$1,134,418 53
(b) Payments under the Financial Agreement with the Federal Government	130,130 09
(c) Fuel oil tax	144,478 62
(d) Fur export tax	48,247 50
(e) Motor vehicle and drivers licences	24,906 58
(f) Business licences	12,996 06
(g) Payments from the Federal Government under various agreements	66,345 31

Territorial expenditures for the fiscal year totalled \$1,797,890.35 compared to \$1,368,053.31 for the previous year. The principal expenditures were:

(a) Education	\$ 512,869 58
(b) Health	188,551 34
(c) Welfare	86,736 18
(d) Development services	65,670 60
(e) Municipal affairs	24,648 69
(f) Operation of the liquor system	833,426 16

At the end of the fiscal year the Territorial Government owned buildings having a book value of \$144,348.00, held debentures from the Yellowknife Public School District worth \$46,250.00, held debentures from the Yellowknife District worth \$64,800.00, held an outstanding loan owed by the Yellowknife Municipal District of \$3,000.00, and had cash in the Northwest Territories Revenue Account totalling \$1,214,219.12. Of this last amount \$98,179.39 was being held as a reserve for Workmen's Compensation, leaving a cash surplus free from commitment in the amount of \$1,116,039.73.

APPENDIX I

Annual Report of the Commissioner, Yukon Territory—1956-57

Commissioner—F. H. COLLINS

Administration

Three sessions of the Council of Yukon Territory were held during the year. The following elected members were in attendance: A. R. Hayes, Carmacks (Carmacks District), Speaker; V. C. Mellor, Dawson (Dawson District); J. L. Phelps, Whitehorse (Whitehorse, East); R. Hulland, Whitehorse (Whitehorse, West); D. C. McGeachy, Mayo (Mayo District).

The appointed officers are H. J. Taylor, Clerk of the Council, and F. G. Smith, Legal Adviser.

The Council met in Whitehorse from November 18 to 20, 1956, and from March 20, 1957, to April 5, 1957. Twelve ordinances were passed at the November meetings and nine at the March-April session (a number of them amending previous ordinances) as listed below:

Session, November 8-20, 1956:

- An Ordinance respecting the Sale of Goods in Bulk.
- An Ordinance respecting Certain Contracts that have Become Impossible of Performance or have been otherwise Frustrated.
- An Ordinance respecting the Public Service of the Yukon Territory.
- An Ordinance to Amend the Vital Statistics Ordinance.
- An Ordinance to Amend the Forest Protection Ordinance.
- An Ordinance to Amend the Disabled Persons Allowance Ordinance.
- An Ordinance to Amend the Municipal Ordinance.
- An Ordinance to Amend the Workmen's Compensation Ordinance.
- An Ordinance for Granting to the Commissioner Certain Additional Sums of Money to Defray the Expenses of the Public Service of the Territory.
- An Ordinance to Facilitate the Reciprocal Enforcement of Judgments.
- An Ordinance to Amend the Insurance Ordinance.
- An Ordinance to Amend an Ordinance Incorporating the Children's Aid Society of Southern Yukon.

Session, March 20 - April 5, 1957:

- An Ordinance to Regulate the Speed and Operation of Motor Vehicles on Highways.
- An Ordinance to Amend the Contributory Negligence Ordinance.
- An Ordinance to Amend the Insurance Ordinance.
- An Ordinance to Authorize the Commissioner to Sell Certain Property in the City of Whitehorse.
- An Ordinance to Amend the Public Service Ordinance.
- An Ordinance to Amend the Business Licence Ordinance.
- An Ordinance to Amend the Poll Tax Ordinance.
- An Ordinance for Granting to the Commissioner Certain Sums of Money to Defray Expenses of the Public Service of the Territory for the Fiscal Year Ending March 31, 1957.
- An Ordinance for Granting to the Commissioner Certain Sums of Money to Defray Expenses of the Public Service of the Territory for the Fiscal Year Ending March 31, 1958.

Territorial Secretary's Department

On the resignation of the Territorial Tax Assessor in August, the Territorial Secretary took over his duties temporarily.

The number of persons receiving Old Age assistance in the 65 to 69 age group was 31, an increase of 11 over the previous year. Of the total number, 21 were Indians.

The number receiving Blind Persons' Allowances remained at six.

The Disabled Persons' Allowances Agreement with the Federal Government was concluded during the year, but no applications for assistance were received.

During the fiscal year 466 births, 119 marriages, and 93 deaths were recorded in the Yukon. These figures included 90 births, 15 marriages, and 22 deaths among Indians.

The 292 business licences issued included 36 general merchants, 34 filling stations, 34 restaurants, 29 contracting firms, 22 hotels, and 22 insurance agencies. Of the 9,986 motor vehicle and operator licences issued, 2,488 were for passenger cars, 1,296 for trucks, and 42 for taxis. There were 3,744 driver's licences issued and 1,717 chauffeur's.

Considerable re-assessment work was done in the Dawson, Mayo, Keno areas. The total assessment for the year was \$2,330,547.26, a decrease of \$29,480.18 from last year. The Court of Revision met on January 8, 1957, in Whitehorse. Seven appeals were rejected, and two were granted adjustments.

Sixty boiler inspections were made in Whitehorse, Dawson, Mayo, Carmacks, and Teslin. Twenty-six engineer's certificates and 22 provisional certificates were issued.

Under the Companies Ordinance, 11 incorporations and 39 extra-territorial companies were licensed or registered. One society was incorporated under the Societies Ordinance bringing the total to 25. Of the 195 companies in good standing, 74 were incorporated in the Territory. Revenue for the year totalled \$6,326.03.

Economic Activities

Favourable winter weather helped to maintain satisfactory progress on the federal housing project in the new subdivision of Whitehorse. In other parts of the Territory, road construction and maintenance was carried on, new bridges were erected, and additional building was undertaken.

Mining activity was comparatively quiet. Claim staking showed some activity in the Whitehorse District where 669 claims were recorded, which was considerably below last year's staking. Interest was chiefly in the Wolf Lake, Tay River, and White River areas. There were 215 claims granted in the Mayo District.

Land activities throughout the Territory showed some improvement over last year, but in Whitehorse there was a slight falling off in the number of titles issued and documents registered, and also in revenue. The recession in the capital was due mainly to a drop in value and in the turnover of city property. Territorial land revenues reached \$19,570.08, an increase of \$1,454.82.

Sawn lumber produced in the Territory last year reached a total of 4,843,207 feet board measure; round timber accounted for 1,714,701 linear feet; fuelwood, 6,550 cords; and railway ties, 6,500. Revenue accruing from timber operations totalled \$40,149.32.

The 200,000 square miles which constitutes the forested area of the Territory is divided into five forest districts with headquarters at Whitehorse, Teslin, Haines Junction, Mayo, and Dawson. About 40,000 square miles are considered to be under protection.

During the 1956 fire season, the weather was generally wetter than usual, but the 55 fires which burned throughout the Territory was slightly above average. The burned-over area was the lowest in seven years. Camp-fires and smokers were the chief causes of fires; together they were responsible for 76 per cent of the year's total. Direct fire-fighting costs were \$13,014.17, about \$7,000 less than last year. The destruction of a roadhouse at Granville and a higher percentage of merchantable timber burned resulted in an increase in fire losses to \$16,021.50, about \$6,700 higher than the previous year.

The ten tourist camp-grounds and seven lunch-stops along the Alaska Highway were repaired and repainted, and two additional camping areas were prepared, one at Richtofen (Fox) Lake on the Mayo Road and one at Kathleen Lake on the Haines Road.

Tourist travel on the Alaska Highway was particularly heavy during 1956, and the camp-grounds and lunch-stops were taxed to capacity during the height of the season.

Public Welfare Services

Because of the increase in social and child welfare problems in the Yukon, the Government of the Territory has expanded its services under a Supervisor, who is also the Superintendent of Child Welfare for the Yukon, a position formerly held by the Territorial Secretary. The Supervisor of Welfare also carries out the administrative work for the health control program.

Seven male persons were adjudged insane by the Magistrate's Court and committed to the Provincial Mental Hospital at Essondale, B.C., as the Yukon Government has no facilities for the care and treatment of the mentally ill. Of six cases discharged from the Mental Hospital, one was unimproved and was discharged to the immigration authorities for deportation to England. The other five cases resumed normal community life and activity. The cost of mental services was \$41,012.93.

Social assistance was provided in 137 cases, of which 28 were family units and 109 individual persons. Temporary assistance was granted to four non-residents. The 137 cases represent a total of 209 recipients. Sixty-seven cases were completed and closed, and 70 cases continue to receive assistance. Social assistance consisted of cash allowances, subsistence allowances, medical and dental attention, hospitalization (territorial and provincial), medicines, clothing, rent, fuel, public utilities services, and transportation and burial services, and involved an expenditure of \$69,523.02, a reduction of \$4,848.93.

Through the co-operation of the Royal Canadian Mounted Police, social welfare services were provided to residents in isolated areas.

An interprovincial agreement was reached between the Territory and the Province of Saskatchewan under which each administration now assumes the cost of social assistance granted to the other's residents on a non-recoverable basis.

Department of Health

There was a general increase in the work of this department. The number of persons receiving attention from the public health nurses was 7,794, an increase of 2,008.

Child health clinics at Whitehorse had an average weekly attendance of 30 children, and attendance at immunization clinics outside of Whitehorse increased.

Routine immunization against smallpox, diphtheria, whooping cough, and tetanus is carried out at child health clinics and in the school health program. Over 4,000 injections were given school children during the year. Typhoid booster clinics were attended by 1,239 persons. The 2,950 injections of Salk polio vaccine given included third doses to all who received the initial two doses in 1955, and three doses (or complete series) to school children in Grades I to V, to 5-year olds, and prenatals.

Sporadic cases of infectious hepatitis occurred during the year.

During the annual chest X-ray survey, conducted in co-operation with the Indian Health Services, 3,928 persons were X-rayed. They included whites, Metis, and enfranchised Indians. Band Indians are the responsibility of the Department of Citizenship and Immigration.

The Public Health Department authorized 134 X-rays at Territorial hospitals of T.B. suspects, and on the recommendation of local doctors 937 persons had chest X-rays at hospitals. Twenty cases of tuberculosis were receiving treatment in various sanatoriums in the western provinces as responsibilities of the Territory. Of this number, 12 cases were already in confinement, eight new active cases were admitted, and seven were discharged. Steady progress is being made in the control of this disease. The number of cases receiving sanatorium treatment was more than 53 per cent below 1954-55.

Nine cases of poliomyelitis occurred in the Territory. Of this number, there were seven non-paralytic; the other two cases had to be removed to a provincial hospital because of severe residual paralysis.

The old hospital at Mayo was replaced with a new 14-bed hospital. Progress was made on the new Northern Health Service Hospital under construction at Whitehorse.

Grants were made to hospitals as follows: Whitehorse General Hospital, \$36,760; Mayo General Hospital, \$10,792; St. Mary's Hospital, Dawson, \$20,666. In addition, special poliomyelitis grants were made to the Red Cross Crippled Children's Hospital, Calgary (\$500), and to the University of Alberta Hospital (\$5,000).

Some 200 premises in Whitehorse were connected to the new water and sewer system, and many more should be connected this year. Inspections made totalled 1,650; notices issued requiring improvements numbered 201; complaints dealt with, 51; and water samples taken, 60.

Department of Game

Caribou migration in the Sixty Mile Road area west of Dawson began earlier than usual, and a predator control program carried out in March indicated that wolves were not so prevalent as it is commonly believed. Registered trappers and resident and non-resident hunters took a total of 4,915 migratory and upland game birds. Spruce grouse and ducks were the principal species taken, with other varieties of grouse, geese, and ptarmigan making up the total. Game animals taken totalled 2,687, with caribou forming nearly 62 per cent of the harvest. Other animals taken were moose, wolverine, bighorn sheep, bears, grizzlies, wolves, coyotes, and mountain goats. The catch of fur-bearing animals by registered trappers decreased by nearly 60 per cent from last year. Squirrel, muskrat, beaver, otter, marten, and cross, red, and white fox were all down, but the drop was offset slightly by gains in fisher, silver fox, lynx, mink, and weasel.

The total revenue of \$26,442.98 was made up chiefly on licence fees collected from resident and non-resident big-game hunters and Fur Export Tax collections.

Roads, Bridges, and Public Works

Maintenance and improvements were carried out on the Atlin, Tagish, Carcross, Mayo, Elsa, Dawson-Boundary, Dawson-Stewart Crossing, Whitehorse-Keno, 2-Mile Hill, Takhini Hot Springs, Fish Lake, Canyon Rapids, Duncan Creek, and federal housing area roads. Streets were constructed in the new Whitehorse subdivision and in the Indian Reservation area.

A program of bridge replacement was started during the year. The Takhini River and Moose Creek bridges were completed, work was undertaken on the Mayo River bridge, and a deck system was installed on the Ogilvie bridge. Several small log spans on the Whitehorse-Keno Road were replaced by culverts.

Four buildings were erected. Two rigid-frame steel structures to be used as workshop and warehouse were built at Whitehorse; a pre-fabricated steel building was erected at Mile 56 on the Dawson Road, and a reinforced concrete and frame hospital to contain 14 beds and nurses' quarters was completed at Mayo. Improvements were carried out on the Whitehorse Consolidated School, the Dawson liquor store and fire-hall, and the Watson Lake, Teslin, and Keno schools.

Statistical Report on Activities of the Public Health Nurse

Individuals receiving Service	1956-57	1955-56
Infants.....	824	891
Pre-school.....	1,600	824
School.....	5,752	3,715
Adults.....	608	356
TOTAL.....	8,784	5,786

Types of Service Provided:

1. Immunization (number of injections)		
Smallpox.....	498	743
Whooping Cough.....	1,270	1,122
Diphtheria and tetanus.....	1,964	1,263
Typhoid.....	1,239	1,121
Polio.....	2,950	416
Schick tests.....	2	3
Tuberculosis tests.....	21	13
Gamma Globulin and anti-measles serum.....	114	400
2. School Services		
Examinations.....	1,183	1,500
Immunizations (also included in Section 1).....	4,568	figures not available
3. Nursing Care.....	86	158
4. Health Guidance.....		
(Consultation where no specific nursing procedure was carried out)...	198	510
5. Social Service.....	10	79
6. Venereal Disease		
Cases.....	17	56
Contacts.....	5	8
7. Tuberculosis		
Cases (Individuals seen by P.H.N.).....	49	67
Others (Contacts, suspects seen by P.H.N.).....	28	53
Admission to Sanatorium.....	8	7
Discharged from sanatorium.....	7	22
Deaths.....	nil	2
In sanatorium at year's end.....	13	12
In rehabilitation home.....	2	nil
X-ray survey.....	3,928	4,001
Follow-up X-ray.....	134	115
8. Out-of-Town Trips		
Carcross.....	7	—
Whitehorse to Watson Lake.....	6	—
To Teslin only.....	1	—
Whitehorse to Mile 1202.....	7	—
To Haines Junction only.....	1	—
Dawson, Mayo-Keno area.....	5	—

Game Department

Migratory and Upland Game Birds Taken by Registered Trappers, Resident and Non-Resident Hunters, Season 1955-56

Ducks.....	1,550
Geese.....	84
Spruce Grouse.....	1,821
Ruffed Grouse.....	321
Franklin Grouse.....	58
Sharp-Tailed Grouse.....	39
Blue Grouse.....	183
Ptarmigan.....	859

Game Taken—Season 1955—1956

	Bear	Grizzly	Caribou	Moose	Sheep	Goat	Coyote	Wolf	Wolverine
Non-resident autumn hunting, 1956:...	4	33	38	35	53	9	1	10	2
Resident hunters 1955-56:.....	51	32	320	151	37	7	13	17	1
Registered trappers 1955-56:.....	48	11	1,304	189	41	4	28	41	207
TOTAL:.....	103	76	1,662	375	131	20	42	68	210

Fur-Bearing Animals Taken by Registered Trappers

	Season 1954-55	Season 1955-56
Beaver.....	2,843	2,112
Fisher.....	20	26
Otter.....	58	43
Fox, black.....	—	—
Fox, cross.....	26	24
Fox, red.....	102	73
Fox, silver.....	1	2
Fox, white.....	379	—
Lynx.....	1,140	1,483
Marten.....	850	819
Mink.....	427	477
Muskrat.....	42,565	35,005
Weasel.....	552	591
Squirrel.....	80,983	40,683

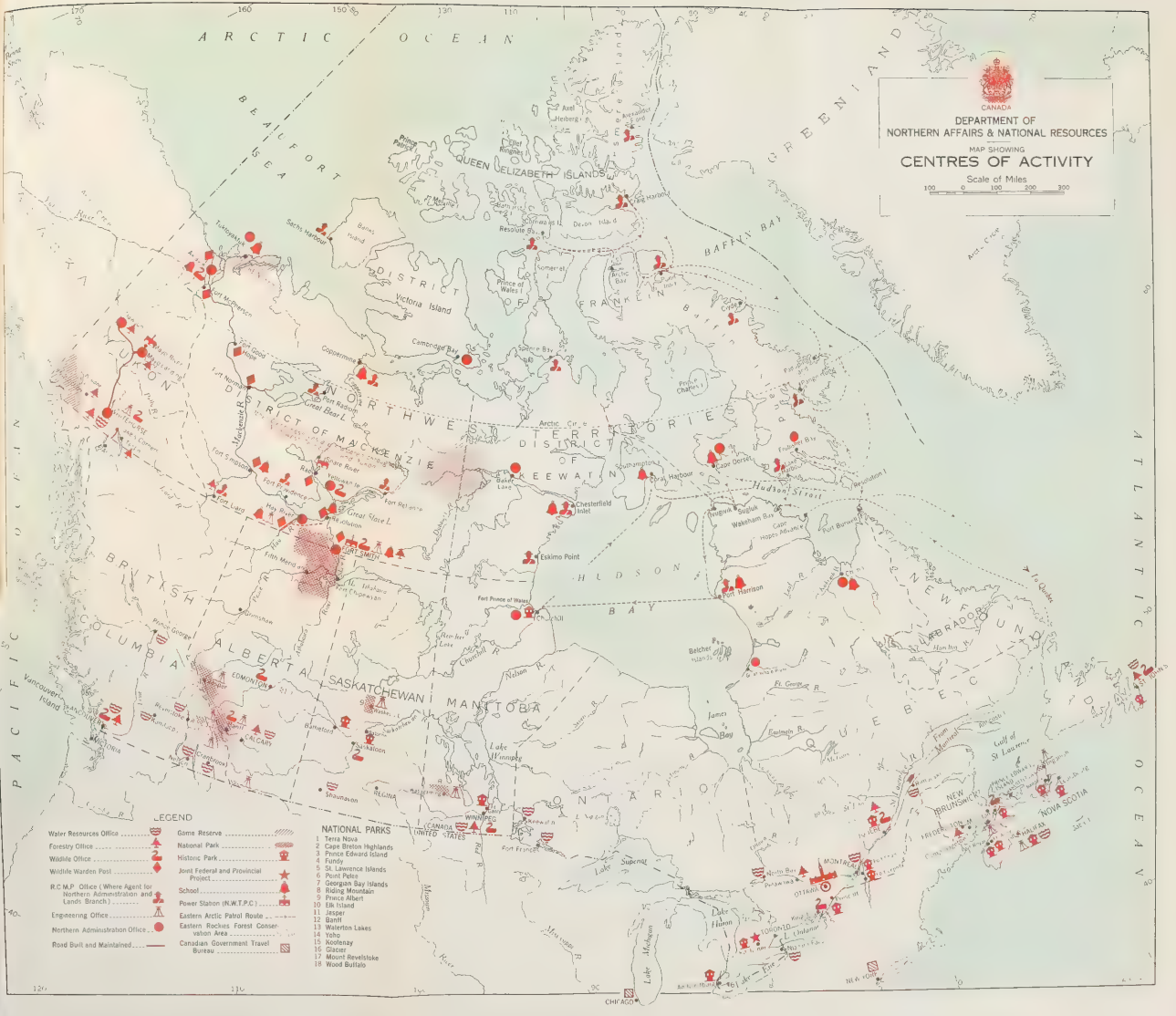
ARCTIC OCEAN



CANADA
DEPARTMENT OF
NORTHERN AFFAIRS & NATIONAL RESOURCES

MAP SHOWING
CENTRES OF ACTIVITY

Scale of Miles
100 0 100 200 300



LEGEND

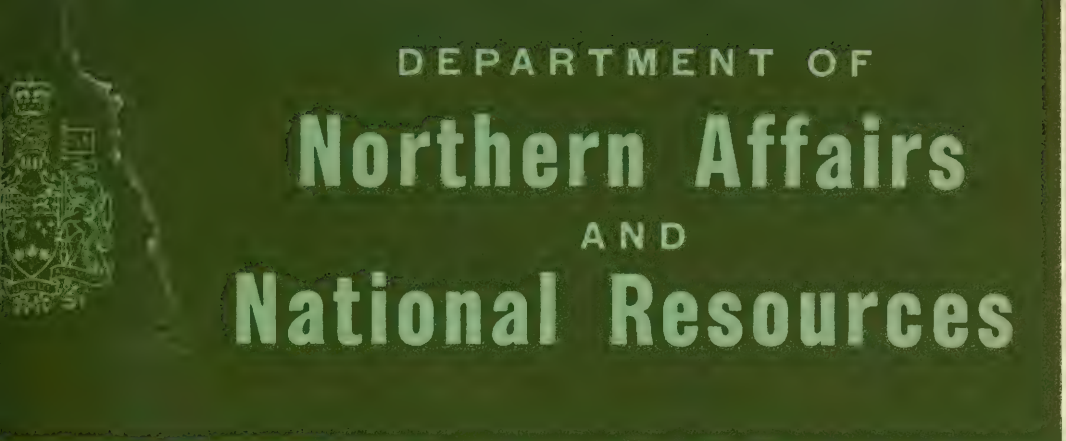
- Water Resources Office
- Forestry Office
- Wildlife Office
- Wildlife Warden Post
- R.C.M.P. Office (Where Agent for Northern Administration and Lands Branch)
- Engineering Office
- Northern Administration Office
- Road Built and Maintained
- Game Reserve
- National Park
- Historic Park
- Joint Federal and Provincial Project
- School
- Power Station (N.W.T.P.C.)
- Eastern Arctic Patrol Route
- Eastern Arctic Forest Conservation Area
- Canadian Government Travel Bureau

NATIONAL PARKS

- 1 Terra Nova
- 2 Cape Breton Highlands
- 3 Prince Edward Island
- 4 Fundy
- 5 St. Lawrence Islands
- 6 Point Pelee
- 7 Georgian Bay Islands
- 8 Riding Mountain
- 9 Prince Albert
- 10 Elk Island
- 11 Jasper
- 12 Banff
- 13 Watkins Lakes
- 14 Yoho
- 15 Kootenay
- 16 Glacier
- 17 Mount Revelstoke
- 18 Wood Buffalo

CHICAGO

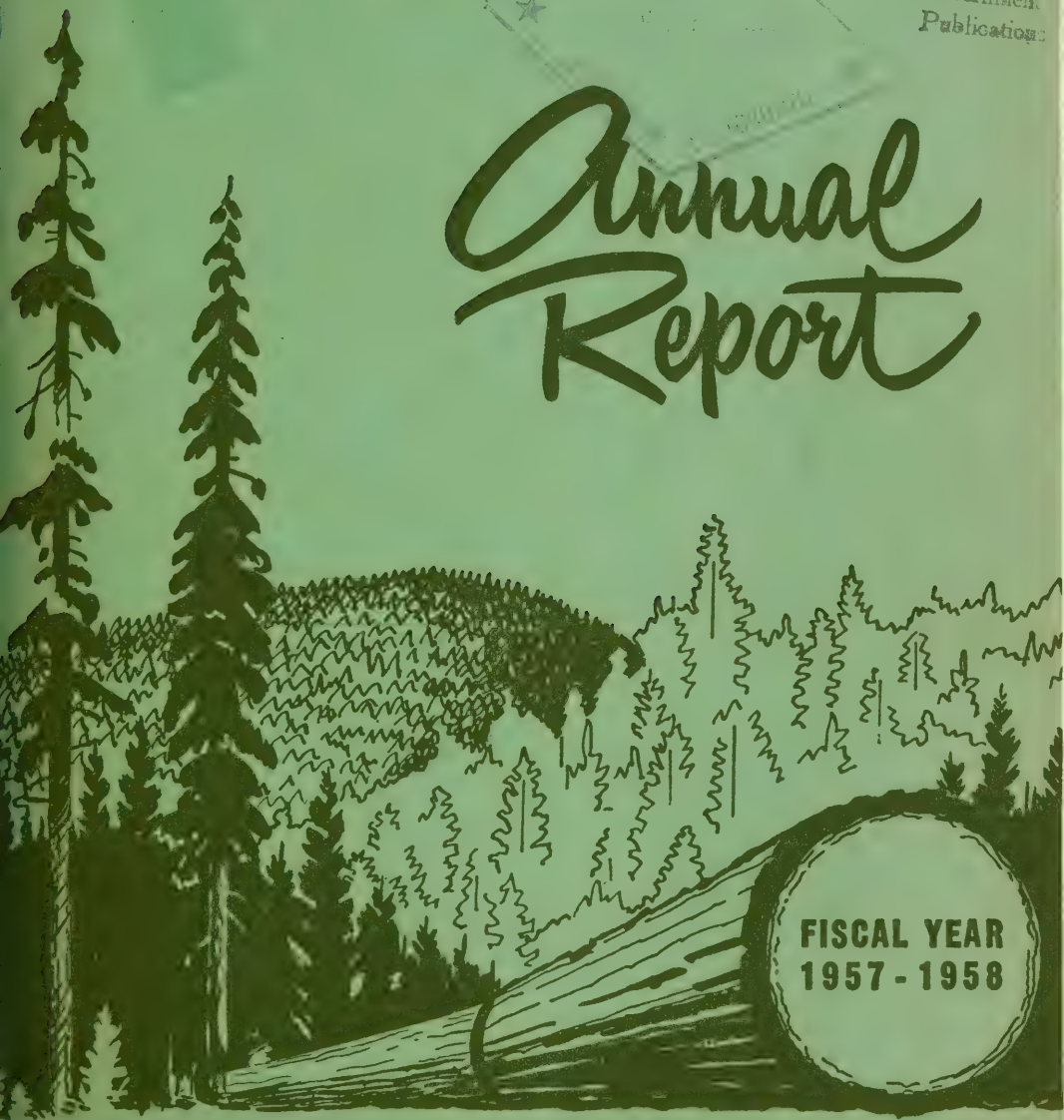
Government
Publications



DEPARTMENT OF
Northern Affairs
AND
National Resources

Government
Publications

*Annual
Report*



**FISCAL YEAR
1957 - 1958**



Government
Publications

*Department of
Northern Affairs and
National Resources*

ANNUAL REPORT

FISCAL YEAR 1957-1958

Including an article
Our Forests — Riches That Grow

Price 50 cents

COVER DESIGNED BY
PAUL JONES, FORESTRY BRANCH, OTTAWA.



THE QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1958

Price 50 cents Cat. No. R1-58

*To His Excellency the Right Honourable Vincent Massey, C.H.,
Governor General and Commander-in-Chief of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the Annual Report of the Department of Northern Affairs and National Resources for the fiscal year ended March 31, 1958.

Respectfully submitted, .

ALVIN HAMILTON

*Minister of Northern Affairs and
National Resources*

The Honourable Alvin Hamilton, M.P.
Minister of Northern Affairs and
National Resources.

SIR:

I have the honour to submit the Fifth Annual Report of the Department of Northern Affairs and National Resources which covers the fiscal year ended March 31, 1958.

While progress was evident in many areas of our work, four outstanding developments highlight the Department's activities for the year under review. First was the decision taken by the Government to establish a modern community at Frobisher Bay to serve this rapidly developing and strategically located air transport centre. Secondly, the winter work program provided a good deal of employment, not only through the acceleration of the Department's normal construction activities but in the forest access roads and campground and picnic area programs carried out in co-operation with the provinces. The third highlight of the year was the passage of legislation and the conclusion of agreements with two of the Atlantic provinces to provide for federal assistance in the field of thermal electric power. Finally, the announcement towards the end of the fiscal year of the Government's Roads to Resources program heralded the Department's entry into a new and important area of national resource development.

It has been another year of growth and increased activity for the Department. This fact is reflected in the substantially higher appropriations provided by Parliament for our work. Total costs in 1957-58 moved up to \$49 million—an increase of nearly one-quarter over the previous year. Of the \$12 million increase, \$7 million were expended for the construction or acquisition of buildings, works, land, and new equipment for northern development and for operation and maintenance. The expansion of forest research and forest conservation and management activities generally added \$3 million to the costs of the Forestry Branch operations. Finally, the construction of roads and other facilities to provide for the larger numbers of persons visiting our National Parks accounted for a \$2 million increase in spending.

Highway construction in northern Canada included a continuation of work on the extension of the Mackenzie Highway to Yellowknife. The road has now been completed as far as Fort Providence from the south, and nine miles have been constructed from the Yellowknife end. Steel bridges on Yukon highways have been erected, and the Canol Road is being re-opened.

There has also been increasing activity in the construction of houses for Eskimos and staff, hostels, schools, vocational workshops, warehouses, and power plants.

Mining exploration was extended to little known areas in the Arctic and Hudson Bay Mining District with the result that more than seventy per cent of the year's staking in the Territories was reported from this area. Staking included iron, copper, nickel, and radio-active minerals, and an iron discovery on Chorbak Inlet, Baffin Island, is estimated to contain 400,000,000 tons of magnetite. Increased interest in lode mining in the Yukon was highlighted by the development of asbestos and nickel-copper deposits and the staking of silver, lead, zinc, and copper showings.

Stimulated in part by the announcement in September that the regulations would be revised, there was greatly increased interest in oil and gas exploration west of the Mackenzie River Delta. At year's end, permits and permit applications covered an area of more than 35,000,000 acres.

During the year, a new school and hostel were opened at Fort Smith. Similar facilities are planned for or are under construction at Inuvik (formerly Aklavik-East 3), Fort McPherson, Fort Simpson and Frobisher Bay, and a consolidated High School and Vocational School is being built at Yellowknife. Federal schools are now maintained at twenty-nine centres. In addition, there are six hospital schools staffed and maintained by the Department. Assistance by way of grants, supplies, and teaching staff is provided to four residential mission schools and to eighteen part-time mission schools. The average attendance of Eskimo, Indian, and other children was 3,600.

The Department continued to be concerned over the inadequacy of radio broadcast services in the far north. At Hay River, where Station CFHR had been forced off the air by the breakdown of its obsolete equipment, arrangements were made to provide the station with a new transmitter so that it could resume broadcasting. Officers of the Department also carried on extensive studies and discussions with the Canadian Broadcasting Corporation and the Departments of Transport and National Defence with a view to working out better arrangements for northern broadcasting generally. (Plans for a greatly improved northern broadcast service were announced by the CBC in June, 1958.)

The very drastic decline in the numbers of the caribou—the principal source of food for many native peoples of the north—was a matter of very serious concern to the Department. In an effort to learn the underlying causes of the steep drop in the caribou population, the Canadian Wildlife Service, in co-operation with the R.C.M. Police, the Indian Affairs Branch of the Department of Citizenship and Immigration, and several provincial game administrations, has undertaken a special research program, which was still in progress at the end of the fiscal year.

Turning to other areas of the Department's responsibility, it was a notable year for the Forestry Branch, marking as it did the completion of

work on four important laboratories valued at nearly \$6,500,000. The official opening of the Petawawa Research Laboratory took place in September, 1957. Forest products research—which is aimed at attaining more realistic conversion practices and more complete utilization of wood substances and residues—will be greatly facilitated by the establishment of two fine modern Forest Products Laboratories at Ottawa and at Vancouver. Finally, the Federal Government has underwritten the entire cost of the new \$2,250,000 building in Montreal to accommodate the Pulp and Paper Research Institute.

The Forestry Branch assumed wide additional responsibilities for forest surveys and for providing technical advice in forest management to other Branches of the Department and to other agencies of government.

Assistance to the provinces, and to the forest industry generally, covered a wide field. All the provinces participating in the 1951 agreements have now completed initial forest inventories, and these studies relate to a gross area of well over a million square miles. Further progress was made in reforestation work in a number of the provinces, and forest fire protection agreements were concluded with nine provinces. As mentioned earlier in this letter, assistance was also provided for the construction of forest access roads and trails. Aerial spraying against the spruce budworm was continued in New Brunswick, and spraying against the black-headed worm on Vancouver Island was carried out with federal financial assistance.

Disturbed economic conditions on both sides of the international border were reflected in the trade and output of forest products. Lumber production slipped 12 per cent to 6.8 billion board feet in 1957, and though mill capacity in the pulp and paper industry continued to increase, wood-pulp production was down 5 per cent to 10.2 million tons. The newsprint output was off slightly from its record 6.5 million tons in 1956. May I respectfully draw your attention to a special article, "Our Forests—Riches That Grow", which appears as a preface to this Report.

Visitors to the national parks were up 11 per cent to a new record figure of nearly 4,500,000—of whom more than 80 per cent were Canadians. Work on park highways and other tourist facilities was pushed steadily forward from the Rockies to the Atlantic seaboard. Continued progress was made on the development of Canada's newest National Park, Terra Nova in Newfoundland, and Grand Pré in Nova Scotia was designated as a National Historic Park. As forecast in the special article that prefaced last year's Annual Report, a special planning division was set up in the Parks Branch for the development of the parks on a long-range basis.

Travel spending by visitors to Canada set an all-time record in the calendar year 1957 with travel revenues from the United States and other countries reaching \$362 million. This was a gain of \$25 million over 1956, the previous high year. Canada's tourist deficit, which had risen rapidly in the past six years, did not increase during 1957, and the adverse balance

with the United States dropped \$7 million to \$75 million. There were over 28 million individual entries into Canada including repeat visits by commuters, businessmen, and all other travellers except immigrants, and longstay automobile entries passed the two and a half million mark—a new record. There was also a marked increase in interprovincial travel by Canadians. At the end of the fiscal year the large number of inquiries being received by the Canadian Government Travel Bureau pointed to the prospect of another good year in 1958.

Systematic studies of Canada's water resources were continued during the year, and some 6,500 stream measurements and nearly 2,200 additional inspections were carried out at the 1,219 stations maintained across the country. More than a million and a half horse-power was added to Canada's installed hydro-electric capacity, bringing it to nearly 20,000,000 horse-power or one-quarter of our total estimated waterpower resources. Canada was represented on 23 international and four federal-provincial boards dealing with problems related to boundary and other waters. In co-operation with other agencies, planning continued in preparation for the World Power Conference, which is to be held in Canada in September 1958.

Field parties of the Natural History Branch and the Human History Branch of the National Museum were active in most provinces and in the Northwest and Yukon Territories. Studies ranged widely over the fields of botany, archæology, geology, anthropology, mineralogy, ethnology, palæontology, and zoology. Numerous additions were made to museum collections, and plans were advanced for re-designing the geology, palæontology, and mammalogy exhibition halls.

The Department continued its interest in questions relating to Canada's territorial waters, and was represented on the delegation to the eighty-six-nation International Conference on the Law of the Sea, which began its deliberations in Geneva on February 24, 1958. An important objective of the Conference from the Department's standpoint was the reaching of agreement on the rights of a coastal state to explore and exploit the natural resources of the sea-bed and subsoil on its Continental Shelf. (The Conference, which came to an end on April 28, adopted a Convention on the Continental Shelf as well as Conventions on the Territorial Sea and Contiguous Zone; The High Seas; and Fishing and the Conservation of the Living Resources of the High Seas.)

I have reviewed briefly, Mr. Minister, some of the highlights of our work during the fiscal year now ended. These and other achievements were only possible because of the effectiveness of a loyal and efficient group of employees. May I also acknowledge here the splendid co-operation the Department has continued to receive from other federal departments of government and from various agencies at the provincial, territorial, and

municipal level. A special word of appreciation should go to the Department of the Secretary of State and the Department of Finance, which provided valuable services to the Department through the Translation Office and the Treasury Office respectively.

Your obedient servant,

R. G. ROBERTSON

Deputy Minister

OTTAWA, July 18th, 1958.

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Inserted at the back of this Report is a map showing the location of national and historic parks; game reserves; highway projects; forestry, water resources, wildlife, engineering and Northern Administration offices and posts, and other centres of departmental activity.

Department of Northern Affairs and
National Resources

Minister	Hon. ALVIN HAMILTON, M.P.
Executive Assistant.....	D. J. THIESSEN
Private Secretary.....	R. A. FAIBISH

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Assistant Deputy Minister.....	E.-A. CÔTÉ
Assistant Deputy Minister.....	F. J. G. CUNNINGHAM
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Advisory Committee on Water Use Policy.....	K. KRISTJANSON

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Legal Division.....	Chief—E. R. OLSON
Personnel Division.....	Chief—A. C. WIMBERLEY
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National Historic Sites Division.....	Chief—A. J. H. RICHARDSON
Engineering Services Division.....	Chief—G. L. SCOTT
Canadian Wildlife Service.....	Chief—W. W. MAIR

Water Resources Branch

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Hydraulics Division.....	Chief Hydraulic Engineer—R. H. CLARK

Forestry Branch

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Forest Research Division	Chief—D. R. REDMOND
Forestry Operations Division	Chief—H. W. BEALL
Forest Products Laboratories Division	Chief—J. H. JENKINS

National Museum of Canada—Natural History Branch

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Geology	J. F. HENDERSON (Hon. Curator)
Mineralogy	S. C. ROBINSON (Hon. Curator)
Palæontology (Vertebrate)	W. LANGSTON JR.
(Invertebrate)	H. W. FREBOLD (Hon. Curator)
Zoology	A. W. F. BANFIELD

*Appointed July 14, 1958.

Department of Northern Affairs and National Resources

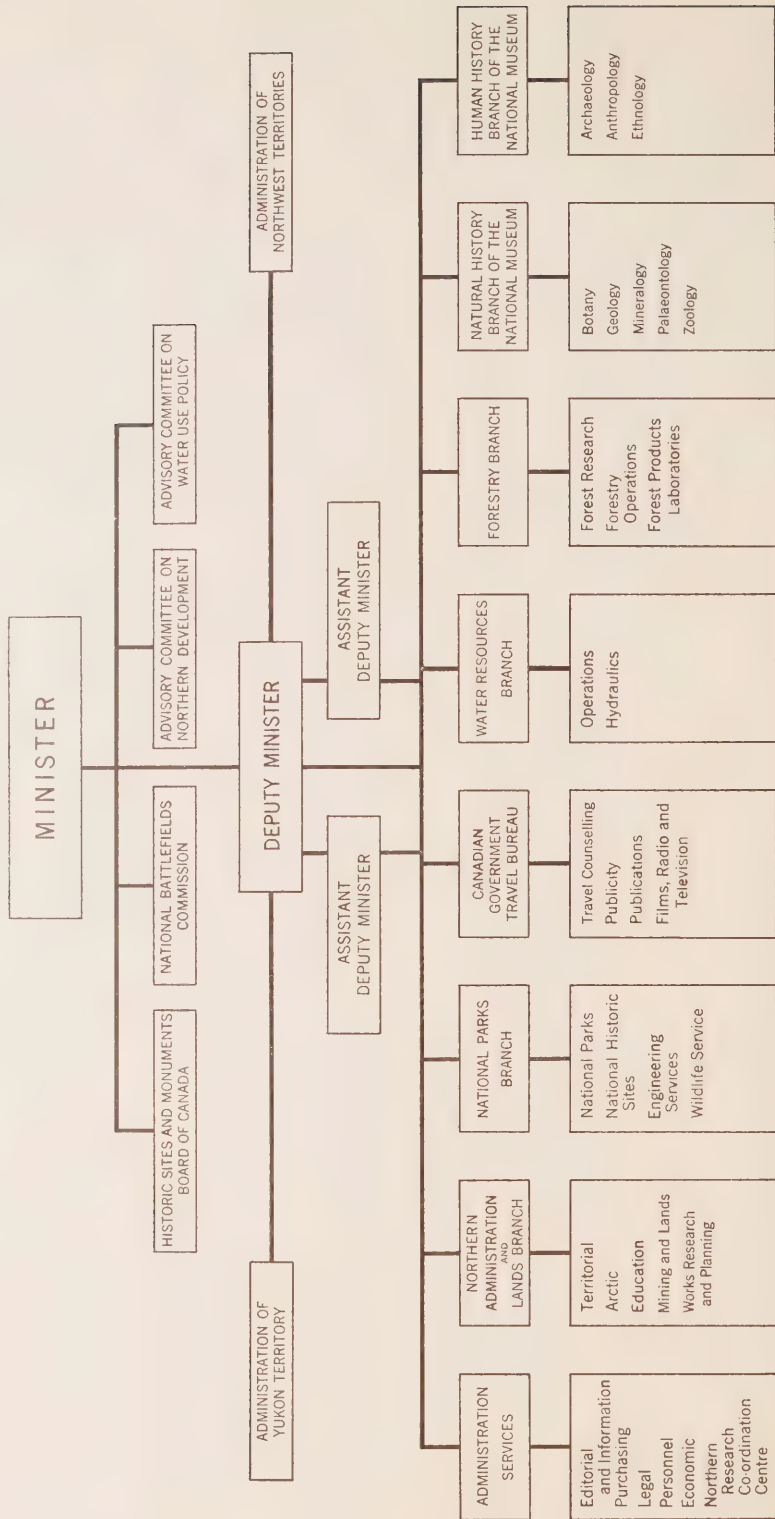
National Museum of Canada—Human History Branch

Director	JACQUES ROUSSEAU
Archæology	R. S. MACNEISH
Anthropology	MARCEL RIOUX
Folklore	CARMEN ROY

Canadian Government Travel Bureau

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Publicity Section.....	R. DEGROSBOIS
Publications Section	VACANT

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES





Our Forests — Riches That Grow

Almost half of Canada's total land area is forested. This rich, growing, replenishable resource extends unbroken across the country in a belt 600 to 1,300 miles wide, forming an intricate mosaic of differing colour, density, type, and species. It is one of the world's finest and most extensive forests. It supplies vast quantities of wood. More than this, it tempers the whole complex of our environment. It controls water run-off, prevents erosion, reduces extremes of temperature, provides a haunt for wildlife, and serves as a magnificent recreational retreat for our people. We are favoured too, by the fact that the greater part of our productive forests, which constitutes about half our total forest area, is comprised of coniferous species. These species are preferred by the lumber and pulp and paper industries. Hardwood species, making up one-fifth of the merchantable volume, account today for only one-tenth of the annual forest harvest in Canada.

For us to accept this great resource as a gift of Divine Providence is not enough; it is imperative that we look upon the resource as a trust which we must protect, and from which we can take, in physical volume, no more than the forest itself can grow. It lies with us to increase our knowledge of how much there is, how fast it is growing, and how fast it is being depleted. The problem is much more complex than merely planting a tree for every tree that is removed. It must be viewed in the light of the past use we have made of the forest and of the existing pattern of ownership of forest land. Further, the problem must be related to future demands on this growing, and yet destructible, resource. This, then, is the story of *Our Forests—Riches That Grow*.

Forests in Use

The folklore and epic stories of the early lumbering days make a picturesque and impressive chapter in Canada's forest history. The lumberjack and his perilous river drives, his life in the remote and transient lumber camps, and his daring escapades have made him legendary. This was a period of forest exploitation to fulfil the needs of a growing population in Canada and the United States and to meet the demand from overseas for square timber. Agriculture too, and its claims on both good and poor land, served to push the fringe of the forest northward. The most desirable timber, within easy reach of markets or shipping ports, began to diminish as new settlers moved north and west.



The period between the mid-19th century and the end of the first quarter of this century was an era of timber mining. The forest, as some records state, was as plentiful as land or water and was there to be exploited. Yet, as a direct result of the unlimited depletion of the southern and more accessible forests during this period, there came the realization that perpetuation of the forests depended upon man's will. The first forest legislation, which recognized timber as an asset apart from land, provided for the leasing of timber land rather than its outright sale. After Confederation, steps

were taken by the Federal and Provincial Governments to decrease the incidence of forest fires, which had greatly depleted the supplies of accessible sawtimber in Eastern Canada. With the advent of the pulp and paper industry, the forests that had been partially logged for oak and pine were cut-over for their spruce and fir. Thereafter, logging for sawtimber moved increasingly westward with the opening up of British Columbia's dense and magnificent forests.

Much of the early, and indeed recent, development of Canada's forest industries is related to periods of European strife. Our forests have proved on many occasions to be an emergency source of supply of forest products for Europe. In Napoleon's day, when shipping blockades prevented normal European supplies from reaching Britain, the forest industries prospered. During World Wars I and II Canada again answered the call for supplies, and this trade, which drew much attention to the excellent qualities of Canadian wood products, resulted in increased exports in times of peace.

The sawmilling industry was a direct outgrowth of the square timber industry of the late 18th and early 19th centuries. The number and capacity of sawmills increased sharply in the period between 1850 and 1860, and a steady output was maintained until the end of the century. Subsequently, the output of lumber in the East declined in relative importance and shifted

to British Columbia. This province soon became Canada's leading producer of lumber. Large mills on tide-water with a hinterland of big timber characterized this industry. More than half of the lumber was shipped, as it is today, to foreign markets. At this time too, the sulphite process of pulping wood for paper was introduced into Canada. The eastern industry in particular, being close to centres of heavy population and industrialization, was quick to respond to the increased demands for paper.

At the beginning of the present century, Canada was already on the road to becoming one of the world's chief sources of wood and paper products. The forest industries were largely dependent on supplies of publicly owned timber. Hence the authorities who retained the rights to dispose of timber by permit, lease, or licence to cut became increasingly aware of the need to perpetuate the resource.

Forest Ownership

For every acre of privately-owned forest land in Canada, between nine and ten acres are administered by either the Provincial or Federal Governments. The Maritime Provinces, however, are an exception, as there is a high degree of private ownership in these provinces. There has been little change in this ratio of private to public ownership since Confederation.

The early history and growth of Canada's forest policy are difficult to separate from the policy governing land alienation. Much forest land was granted to the private individual to encourage settlement in Canada, but evidence shows that a large portion of the land cleared for agriculture could have served the national interest far better if it had been left to produce successive crops of trees. Had the policy been followed of setting aside non-agricultural lands for the production of timber, much of the history of timber regulations and the forest industries would have been altered. Canada would have been better off in regard to both agricultural and forestry development. However, this was not so.

New Brunswick made an attempt to institute a form of forest licensing in 1820. It was not until the 1850's, however, that a more secure form of licensing was established, permitting the removal of timber without the sale of land. Later, in Quebec and Ontario, rights to cut timber were put to public tender, and the form of disposal was by licence, lease, permit, or timber berth. Basically, the same system is at present in existence across Canada, although the scope



of the regulations is considerably broader. In order to practise perpetual yield forestry, companies and private individuals are now given the incentive of managing their own timber areas, under long-term leases or licences.

Most of the Crown forests today are owned and administered by the provincial governments. The Federal Government administers the forest lands of the Yukon and Northwest Territories and all other federal lands such as national parks and forest experiment stations.

In general, the role of the Federal Government, as authorized by the Canada Forestry Act of 1949, is to maintain forest experiment stations and forest products laboratories and to provide financial assistance to the provinces to enable them to improve the management of their forests. Federal assistance to provincial governments in recent years has been provided in forest protection, forest inventories and reforestation, and in the building of forest access roads.

The two most important phases of provincial administration are the protection of the Crown forests and the disposal of Crown timber to the forest industries. Protection of the forests against fire is the most urgent duty of the provincial forest authorities, and the cost of providing the services necessary to prevent, detect, and suppress forest fires has for many years exceeded expenditures in other spheres. The disposal of Crown timber, as was stated earlier, varies in nature from the short-term timber sale, where the operator is required to remove the timber in one or two years, to the long-term forest management licence, where the forest lands are conditionally reserved for long periods. Many forms of lease or licence exist in Canada, but, in essence, the principle that no Crown forest lands should be sold characterizes the policy of all provincial forest administrations.

Although a high degree of state forest land ownership may be generally considered to be in the best national interest, it does not mean that private forest ownership is not conducive to good forestry. Some of the woodlots in our farming areas provide examples of excellent management under private ownership. With good transportation close by and an adequate winter labour supply from farms, they make a significant contribution to the total forest production of Canada. Indeed, private forests certified as tree farms, together with other farm woodlots, present the most challenging opportunity at the present time for intensive forest management in Canada.

Forestry Problems

The forest resources in Canada are probably our most important replaceable and self-replacing asset. Deliberate planning and control are required to achieve the fundamental objective of maximum production in perpetuity: to balance cut with growth and, in cutting, to make the most effective use of the forest while allowing for a future growing stock at least as valuable as that removed. In striving to apply this principle to the greater part of our national forests, there are many problems to be considered. The greatest threat is fire, with its attendant loss in productivity. There is also

the problem of reducing the harmful effects of insects and disease. Finally, there is the more positive problem of increasing the yield from our forests through the science of silviculture.

The great Miramichi fire of 1825 took the lives of 160 people and laid waste 2,000 square miles of forest lands. It was but one of the many disasters which lead to the recognition in 1906 that forest fires posed the greatest single threat to the national forest resource and to the prosperity of our forest industries. The forest authorities, established shortly after the Forestry Convention of 1906, set out to reduce the mounting losses caused by the fire menace. It was soon evident that more than eight out of every ten fires were caused by man and that the greatest problem was to prevent man from starting them. Consequently, laws were enacted, and penalties imposed on those who showed carelessness or neglect in the use of fire in the forest. Expenditures on fire protection now amount to at least half the cost of all forest administration in the country as a whole.



Insects and disease, like fire, take a heavy annual toll of our forest resources, and the losses of standing timber caused by these two agencies may well exceed the losses attributable to fires. Yet their nature makes them very difficult to control. The losses may include the volume of merchantable timber killed by insects or disease; an accumulating volume of decay in mature or overmature stands; mortality in immature forests, representing a loss in future volume growth; reduction in growth rate by repeated defoliation by insects; and the destruction of logs and pulpwood by beetles and decay. Control measures to date have been directed more toward outbreaks of harmful insects than against tree diseases. By maintaining a vigilant survey of insect populations it has been possible to forecast insect epidemics with accuracy and therefore to plan extensive control operations. These large operations require the co-operative effort of industry and governments. The spraying operations that have been carried out against the spruce budworm in New Brunswick, Quebec, and British Columbia in recent years are good examples. Improved forest management and utilization practices may, in the long run, provide adequate control against native insects and diseases. More direct measures of control (chemical, biological, or sanitation) are needed to combat insect pests and diseases brought into Canada from other countries. It is only by strict enforcement of quarantine regulations that the arrival of others can be prevented or at least deterred.

The concept of increasing the productivity of our forests through silviculture and improved utilization practices is not a new one. European foresters

have been tackling this problem for more than two centuries and have developed many important systems and techniques. In Canada, where forestry must be practised mostly on an extensive, rather than an intensive scale, many of these European systems fail in their application as they prove to be uneconomical. However, to put into practice even the simplest form of silviculture requires a wide and detailed knowledge of forest conditions.

In the first two decades of this century, little was known of the nature, extent, volume, and growth rates of our forest resources. By the 1920's, however, forest inventories were underway in most provinces. Based on the results of these stocktakings, the authorities were in a much more favourable position to establish realistic control measures and regulations and to relate drain to existing supply. The relation of drain to growth potential, a more far-reaching concept, led to the formulation of the present system of working plans and systematic forest management. Working plans, including the long-term and short-term cutting plans for large forest properties, are required now by provincial forest authorities and must be approved before cutting rights are granted to the lessee or licensee. In some instances the lessee is also required to make provision for, and even ensure, satisfactory regeneration following his cutting operations. Provincial and federal authorities provide help by distributing seedlings to operators who have been unable to obtain satisfactory natural restocking. This is not so great a problem in the extreme eastern and western provinces where natural seeding is normally obtained with little effort, thereby saving the need for costly planting.

Assuring the new stand is only one of the objectives of silviculture. Just as important is the need to increase the yields from the forest, in both quantity and quality. Much work is being done today toward achieving this aim, yet greater effort is required. Solutions must be found to the problems of using species hitherto ignored and of increasing the uses made of both the traditional and new species. In addition, it is important that there be developed more efficient methods of handling wood being extracted from the forest.

Research and Education

Research in forestry and forest products is directed toward finding solutions to the problems referred to in the previous section. Research along these lines has been carried out in Canada for more than 40 years, although before World War II greater emphasis was placed on forest products research. Forest industries were much more concerned with the physical and mechanical properties of wood and with speeding the output of their mills (in their efforts to establish domestic and foreign markets) than they were with improving conditions in the forest, most of which was owned by the Crown.

Following the war, the increased tempo of Canadian forest production brought with it a growing awareness on the part of the forest industries and governments that forest and forest products research were essential to the future welfare of the Canadian forest economy. Programs of research in

silviculture, forest management, and forest products, together with their economic application, were greatly expanded by the Federal Forestry Branch. Expansion occurred also in the work being carried out by the Science Service of the Federal Department of Agriculture in forest entomology and forest pathology. Provincial governments stepped up their research in silviculture, some of the forest products industries set up research programs of their own, and the work in pulp and paper research received special attention.

The development in all phases of research, aimed at greater productivity in the forest and in the manufacturing processes, continues to be of prime importance at industrial, university, and government levels. Those engaged in research programs in these fields are normally graduates from one of the four universities of Canada that offer professional training in forestry. However, there is an increased tendency for chemists, physicists, and engineers to participate in forest products research.

Public and high schools are recognizing the importance of introducing forestry courses into their curricula. Provincial forest agencies and forest industry associations help them by providing films, lectures, and literature, and by offering scholarships. The Federal Government has continued to distribute forestry literature to schools and other appropriate bodies across Canada.



Public education programs are conducted through all possible communication media in our country. They are planned and put into operation by many different agencies including the Federal and Provincial Governments, the Canadian Forestry Association and the Canadian Tree Farm Movement which it sponsors, and associations of the forest industries. Greatest emphasis has been on fire prevention, though promotion of the concept of forest conservation has also received much attention.

And yet, despite all this activity, there is evidence that public education respecting forestry is still deficient in Canada. The continuing high incidence of forest fires caused by human carelessness suggests that new and better approaches must be adopted to establish a greater public consciousness of the value of our forests.

Present Industry and Trade

Drawing on the forests for their basic raw material, the forest industries contribute in a large way to the economic well-being and to the high standard of living enjoyed by the Canadian people. Woods operations are one of Canada's foremost sources of employment. They provide direct employment for 7 per cent of our working force and account for 17 per cent of the net

value of production of all Canadian manufacturing. As a source of foreign exchange they lead all other industrial groups. This is the outstanding record of the forest industries, which include the primary woods operations, the transportation of wood to the centres of manufacture and its conversion in the sawmills, the pulp and paper mills, and the wood- and paper-using groups of industries.

The differing nature of the woods operations across Canada is related to the variations in climate and topography, the contrasting sizes and values of timber stands, and the proposed uses of the resources. The greatest period of activity in Eastern Canada is during the autumn and winter months when conditions favour the felling and initial transporting of wood from the forests to the rivers or to the truck-loading points. In contrast, the more temperate climate of Canada's West Coast permits woods operations to be carried out more or less throughout the year. Here, where the trees are larger and the terrain is far rougher than in the East, heavier and more powerful equipment is used to haul the heavy logs by aerial cable or tractor to assembly points for trucking or railing to the log dumping yards.

The bulk of primary forest products in Canada is transported by water. In Eastern Canada the river drive of the late spring and summer is a spectacular phase of log transportation. Equally fascinating is the distinctive raft-towing industry of the Pacific Coast. Transportation by truck and rail, while of some importance in moving logs to sawmill and pulp mill, contributes much to the finished product distribution of lumber, pulp and paper, and other end-products of the industry.



Canada's sawmilling industry is characterized by a few very large mills, situated mainly in the coastal region of British Columbia; a great multitude of medium-sized mills, located across the country to the Atlantic Coast; and many small sawmills of relatively minor importance. The permanent year-round sawmills of the British Columbia coast produce over one-third of all Canada's lumber, and yet only 5 per cent of the nation's sawmills are located there. The mills run at high speeds and turn out a wide range of specialized grades and sizes of lumber. A notable feature is their ability to alter specifications rapidly to meet changing market conditions. Exports of lumber from this region have in recent years accounted for half the Canadian total of lumber exports. The main markets are the United States and the United Kingdom, with smaller quantities going to almost every part of the globe. The medium-sized mills, in contrast, are not gauged to supplying the needs of overseas markets. Their production is normally absorbed domestically and, to a lesser extent in the United States market. The sawmills of the Maritime Provinces and Quebec, however, are an

exception, since they ship significant quantities of lumber to the United Kingdom. The total volumes, nevertheless, are small when compared to volumes exported from British Columbia to that country. There has been an increased tendency during recent years for the lumber industries to be more dependent for their markets on the United States than on the United Kingdom.

Canada in 1956 produced 7.7 billion board feet of lumber, of which about one-half was exported. The lumber industries' net value of production was nearly \$300 million in 1956, reflecting a slight drop since 1955, the peak production year. And yet this was less than half the value of production of the Canadian industrial giant, the pulp and paper industry.

Probably the most spectacular feature of Canada's industrial development in the past half century has been the rise of the pulp and paper industry to the position of the leading manufacturing industry. It heads all other manufacturing in terms of net and gross value of production, total salaries and wages paid, and in the consumption of fuel and electricity. Significant, too, is the fact that Canada yearly produces no less than half the world's output of newsprint, amounting to some 6½ million tons in 1956. For newsprint, as for lumber, exports to the United States account for a large part of our output. In 1956 nearly 79 per cent was exported to the United States, and 12 per cent went to 65 other countries. The remaining 9 per cent was used in this country.

There are now 127 pulp and paper mills in Canada employing some 65,000 persons. Although there has been considerable development in British Columbia in the post-war period, the greatest concentration of pulp and paper mills is in Eastern Canada. Quebec alone accounts for nearly 50 per cent of the total production in Canada, and all but two provinces take a hand in maintaining Canada's world lead in the manufacture and export of pulp and paper. The new mills and the speed-up of existing machines in recent years have led to a situation where the capacity of the pulp and paper mills exceeds demand. Next to newsprint, market wood-pulp adds substantially to the value of production of the industry. In 1956 Canada's gross value of production of paper, pulps, and paper boards was worth over \$1 billion.

The wood- and paper-using groups of industries make up the final important segment of the forest industries. Significantly, most of the production of these groups is consumed within Canada, either because tariff barriers limit the export of some classes, such as softwood plywood, or because domestic shortages exist, as with furniture. Even so, in the wood-using group, the value of furniture production exceeds the two next most important classes—sash and door and planing mills, and veneer and plywood—by a fair margin. The manufacture of softwood plywood has shown a remarkable rate of growth since World War II. These three segments of the wood-using group accounted for 80 per cent of the group's gross value of products, which reached \$815 million in 1956.

The paper-using group of industries includes those which manufacture commodities of paper and paper board. Consistent with the increase in primary paper and board productions, this group, including the development of the important wood particle and fibreboard industry, has enjoyed the greatest expansion in the past decade. Its net value of production is about half that of the wood-using group.

The over-riding theme in this discussion of Canada's forest industries is the extreme dependence we place on our ability to maintain a high level of exports of newsprint and lumber to foreign countries. The history of the forest industries is strong witness to its extreme vulnerability in the economic tide of our export markets. And yet, within the last few years there have appeared several economic studies, all pointing toward the continued prosperity of Canada's forest industries.

Outlook

A century ago the lumber industry was in its infancy in Eastern Canada. Demands on the forest were growing, but there was little or no real forest consciousness, let alone any move to perpetuate the resource. Forest fires posed a threat only in so far as they endangered man and his belongings.

Fifty years ago the story was different. The pulp and paper industry was gaining momentum, and although lumbering was shifting westward, the demands on the forest were increasing. Forest fires had been recognized as the major forest enemy, and a distinct forest consciousness was developing. Yet the main hindrance to the growth of forestry in Canada was ignorance of the forest potential. Because of this, alarmists were preaching a timber famine in the near future; some indicating it would come in ten years, others in twenty, and still others in fifty years. And while the owners and authorities took measures to prevent such a catastrophe, nature continued her silent work, adding growth to growth, replenishing the burned-out forests and re-stocking the lands depleted by the early lumberman. Now, not only is there no timber famine, but it is predicted that our resources could support a forest industry twice its present size. We find, too, that the age-composition of the forest is better suited than it was to the introduction of sustained yield forest management, and although the fire threat will remain a major problem, there may be a decline in losses from insects and disease.

We have, it would seem, a fairly healthy outlook for supply and the conditions favouring supply. But nothing has been said of the cost of supply, the cost of labour, or the cost of transportation in developing the supply. These elements will take on an increased importance in the future. They can be reduced, in part, by greater productivity within the forest and the forest industries and by improved programs of research and management. And it is only with the fulfilment of these conditions, given the continued health of our export markets, that we can reasonably expect the forest industries to maintain their position as the front-runners of the national economy.

Annual Report of the Department of Northern Affairs and National Resources

Northern Administration and Lands Branch

The administrative responsibilities of this Branch involves an area more than half the size of all the provinces put together and a population of something less than 32,000. These responsibilities, which include Eskimo affairs, the natural resources of both the Northwest and Yukon Territories, and certain Crown lands and mineral rights in the provinces, are distributed among the five divisions of the Branch.

Northwest Territories administration is carried on by the staff of the Branch, because there is no territorial civil service. In the Mackenzie District both federal and territorial responsibilities are borne by the Territorial Division. In other parts of the Territories, it represents the Territorial Government and administers Wood Buffalo National Park lying across the Northwest Territories-Alberta boundary. Administration of Eskimo affairs generally and other federal responsibilities north of the tree-line is the chief concern of the Arctic Division. Matters related to the administration of mineral and other resources are dealt with through the Mining and Lands Division; supervision and extension of educational facilities come under the Education Division, and the activities of the Works Research and Planning Division are indicated in its title.

The Yukon Territory is administered by a territorial civil service under the Commissioner. Advice on federal activities and their co-ordination, including general supervision of government affairs in the territory, is provided by the Territorial Division.

Territorial Division

Field offices were maintained throughout the Mackenzie District, at various points in the Yukon Territory, and in Edmonton, Alberta.

In each territory there is a council, which has legislative powers roughly analogous to those of a provincial legislature. An exception is that the Federal Government has retained the control and management of all natural resources except game. These Councils enact municipal legislation under which certain powers over purely local matters are delegated to local municipal government bodies in accordance with the usual provincial pattern.

Northwest Territories

The Council of the Northwest Territories consists of nine members: five appointed by the Federal Government and four elected every three years

from constituencies in the Mackenzie District. The Council usually meets twice each year, once in Ottawa and once in the Territories. In June, 1957, it met at Frobisher Bay, Baffin Island, for the first meeting in the Territories outside the Mackenzie District. A Commissioner appointed by the Federal Government is responsible to the Minister of Northern Affairs and National Resources for the administration of the government of the Territories. This appointment is held by the Deputy Minister of the Department.

Territorial employees operate the Territorial Liquor System. Legislation and policies of the Council relating to such matters as game management and conservation, forest protection, health, welfare, labour, municipal affairs, liquor, professional and business licensing, motor vehicle control, taxation, and workmen's compensation, are administered by federal civil servants. A review of activities in these fields is contained in the Annual Report of the Commissioner of the Northwest Territories, which appears as Appendix H to this report.

Aklavik Relocation

Good progress was made on the two departmental hostels being built to accommodate a total of 500 students. Foundation piling was placed for the 25-room federal school, for the federal hospital, and for the federal office building. Northern Canada Power Commission placed the foundation piling for the power-house and central heating plant. The road to the air strip was completed and in use, and construction work on the air strip was continued. A number of building lots at the new site were allocated for private use, and compensation negotiations were completed with a number of residents of the old town. The Department operated temporary schools at the new site for the children of construction workers.

Fort Smith Town Planning

A development plan, prepared for the Department by Central Mortgage and Housing Corporation, received general approval at a public meeting of residents of Fort Smith. Development regulations to implement the plan were brought into effect. A new residential subdivision containing 200 lots was surveyed. Consulting Engineers were engaged to make recommendations regarding revision of the water system and installation of a sewer system.

Yukon Territory

The wholly-elective Council of the Yukon Territory consists of five members, with a three-year term of office. A resident Commissioner appointed by the Federal Government is responsible to the Minister for the administration of the government of the Territory, and a territorial civil service carries out the administrative functions. The Territorial Division examines and reports on all Yukon legislation and policies, and acts in an advisory capacity on Yukon territorial matters generally.

A review of the activities of the Territorial Government is contained in the Annual Report of the Commissioner, which appears as Appendix I to this report.

Wood Buffalo National Park

The increase in importance of the forest resources of Wood Buffalo National Park, one of the largest national parks in the world, resulted in greater emphasis being placed on fire prevention and suppression measures. New fire-towers and ranger-patrol cabins were constructed, and roads and trails were extended and improved. The 1957 fire season was very wet, and although there were three fires, only $2\frac{1}{2}$ acres of forest land were burned over. Comparable figures for recent years are as follows: 1952, five fires burned 115,000 acres; 1953, nineteen fires burned 961,449 acres; 1954, five fires burned 1,072 acres; 1955, fifteen fires burned 49,428 acres; 1956, four fires burned 1,600 acres.

The park is estimated to contain between 12,000 and 14,000 buffalo. A new abattoir was constructed at Lake Claire, and a buffalo slaughter was conducted in the area early in the winter of 1957. From the 450 buffalo killed, 251,675 pounds of meat were produced for sale in the North. It is expected that future slaughters in the Lake Claire area will average at least 500 animals a year, with meat production exceeding 300,000 pounds.

Arctic Division

It becomes increasingly evident that Arctic lands will no longer support the traditional hunting and trapping economy of the Eskimos; even less will they support the rapidly growing Eskimo population. Consequently, new outlets must be found to preserve the Eskimos' economic independence and to permit them to share in the rising living standards of the country.

One of the principal new opportunities for the Eskimos is wage employment in mining, transportation, administration, and defence installations. About 10 to 15 per cent of the population is now in wage employment, and although the number is growing, it is unlikely to exceed 50 per cent of the population in the next generation. Those accepting wage employment are gradually being integrated into their new environment. For those Eskimos still on the land, better management and conservation of resources as well as diversification of activities are urgently needed to help raise their living standards and to avoid the serious strains and recurring crises with which the land economy is fraught. There are opportunities too for other Eskimos to shift from the traditional to the new life by accepting wage employment to augment their income without abandoning completely their old life on the land.

Field Staff

To cope more effectively with changing conditions in the Arctic, a trained field staff is being developed to supervise the long range objectives

of the administration. Northern Service Officers have been established at Frobisher Bay, Cape Dorset, Fort Chimo, Great Whale River, Churchill, Rankin Inlet, Baker Lake, Tuktoyaktuk, and Cambridge Bay, and a new post was opened at Sugluk, early in 1958.

The work of Northern Service Officers is as varied as the country in which they live. A few are concerned with the problems of people in remote areas relatively unaffected by inroads from the south, while others work almost entirely with Eskimos in wage employment in mining, on the DEW Line, and elsewhere.

The Arctic Division has established a foundation of basic welfare services designed to meet some of the more serious problems affecting Eskimos. There are now three social workers in Ottawa and three in the field. One, the first woman social worker in the Arctic, was posted to Frobisher Bay early in 1958. During 1957, welfare services were re-organized allowing four broad vocational lines, namely: rehabilitation services, hospital services, public assistance, and child welfare.

A Rehabilitation Centre, established at Frobisher Bay, admitted its first Eskimo residents in September, 1957. It is a multi-discipline setting designed to meet as many of the rehabilitation needs of former tuberculosis patients as possible. The Centre operates, in addition, a laundry, bakery, cinema, and handicrafts centre as part of its program.

Regular visits were made to hospitals across Canada, and assistance was rendered both to Eskimo patients and to hospital staff by Eskimo linguists and social workers. Communication between separated members of families was maintained by tape-recorded messages, progress reports, and the exchange of letters. A social worker also worked with the medical team of the Eastern Arctic Patrol on problems resulting from illness and admission to hospitals.

Relief policies and practices were reviewed in an attempt to work out more objective criteria of eligibility and to gear assistance more effectively to rehabilitation. This included the introduction of work-relief programs for able-bodied recipients and case-finding to give eligible persons the benefits of blindness and disability allowances, old age security, and old age assistance.

A child welfare program has been developed, and a number of neglected children have been taken into care and placed in foster homes and adoption homes. At Churchill, a Children's Receiving Home has been set up as a means of caring temporarily for neglected or homeless children.

To serve as a research tool, an "Eskimo Index" has been created to provide a measure of the effectiveness of some of the programs and to point up gaps in services. It records and correlates health, welfare, education, and economic data on Eskimos individually and by family units.

Arctic Projects

A number of projects, mainly experimental, are intended to provide means of expanding and diversifying the Eskimo economy.

Efforts to stimulate carving and maintain artistic standards were continued. The estimated return to the Eskimos for their stone carvings increased about 20 per cent from the previous year to approximately \$120,000.

In co-operation with the National Museum of Canada, arrangements were made for several exhibitions of Eskimo arts and handicrafts, including the major exhibition at the Brussels Fair. A supervised handicrafts project was carried out on the C.G.S. "C. D. Howe" during the Eastern Arctic Patrol for the benefit of Eskimos being repatriated.

The total count of reindeer at the annual autumn round-up was 5,929. Losses through straying totalled 558. The reindeer are now divided into two herds, one the main government herd, the other the Eskimos'. Owing to the lack of appeal of herding reindeer as a source of livelihood for modern Eskimos, emphasis was placed on consolidation of the herds and efficient, large-scale herding according to modern methods. Studies were made to develop techniques suitable for fencing the range under permafrost conditions.

Experiments in the collection of eiderdown and its use for clothing were carried on at Cape Dorset and Payne Bay, with the continued interest of the Eskimos. Measures for eiderduck conservation were conducted in these localities, with the co-operation of the Canadian Wildlife Service.

Field experiments in the use of Arctic marine life resources were carried out, and further research was done to assess their potential for both domestic and commercial harvesting. This work was done with the co-operation of the Department of Fisheries, the Royal Canadian Mounted Police, and the Fisheries Research Board. Practical field tests at Pond Inlet revealed a potential industry based on Greenland shark.

The prototype of a small boat of low capital and operating costs for use in Arctic waters was developed to decrease hunting costs for Eskimos and to increase their personal mobility.

Study and experiments were undertaken to develop low-cost housing for Eskimos using materials indigenous to the Arctic or capable of being transported to the Arctic at low cost. A simple prototype was built at Frobisher Bay. A styrofoam igloo, constructed at Cape Dorset, passed its second successful winter.

Experiments were carried out in the use of technical devices suitable for Arctic use; examples, stoves suitable for efficiently burning animal oils, peat, and other indigenous fuels; cold storage units; low-cost containers for handling and storage of meats and oils.

In co-operation with the Department of Agriculture, experiments in animal and poultry husbandry and production of forage crops continued.

Frobisher Bay

The opening of the Frobisher Bay airport for civilian use in September 1957 has greatly stimulated the development of the area. Two major international air-lines are providing regular service from western North

America to Europe and are using Frobisher Bay as the stop-over point on this route. Several other air-lines are expected to follow within the next few years. In order to supply fuel to them, two major oil companies have moved into Frobisher Bay. Two banks have established branches.

In anticipation of the rapid growth of this community over the next few years, an interdepartmental committee, styled the Frobisher Development Group, was established to co-ordinate the work of all government departments concerned with Frobisher Bay, and a Project Office was established to carry out the engineering planning of the new community. At the end of the year an engineering survey to establish the most suitable site for a new community was underway.

Re-organization of the Department's administrative set-up at Frobisher Bay involved the appointment of a full-time co-ordinator responsible for the direction and co-ordination of all departmental activities in the community and surrounding district.

Arctic Development

A Development Section was formed in the Arctic Division to stimulate the economic development of the Arctic.

Several industrial and commercial enterprises, which began operations in the Arctic during the year, were encouraged to make use of Eskimo employees in their operations. There is expected to be an increasing demand for Eskimo employees in the Arctic.

Work was begun on a program of Eskimo self-help enterprises, which are expected to be organized as producers' and transportation co-operatives in various Arctic regions. These co-operatives will fill the dual role of providing instruction in the complexities of our economic system and of giving the Eskimos a greater opportunity to control their economic affairs.

There have been growing indications that the North offers numerous opportunities for a tourist industry. Working closely with other interested Government agencies and potential tourist camp operators, the Arctic Division is formulating a program of tourist development which will be of considerable economic benefit to local people.

Market research is being undertaken for a variety of raw materials and finished goods coming from the Arctic. Mercantile outlets in the south have expressed interest in Arctic products, especially some foodstuffs which will be made available on an experimental basis.

In establishing liaison with private industry, the Arctic Division is attempting to apply the findings of government research to the problem of reducing costs in the fields of construction, food processing techniques, and Arctic clothing and transportation. It is now in the process of publishing a manual dealing with these problems.

For the benefit of incoming industry, pilot economic studies of promising areas, which give information on local food, fuel, and building supplies, and their relation to the production and marketing of the final product, are being prepared.

Mining and Lands Division

The trend in mining exploration was away from the established areas along the westerly edge of the Precambrian Shield to virtually unknown areas in the Arctic and Hudson Bay Mining District of the Northwest Territories. In the Yellowknife-Mackenzie District, an interesting find of lead, zinc, and copper was located about 100 miles northeast of Fort Resolution.

In the Yukon staking of quartz claims on showings of silver, lead, zinc, and sulphides containing copper reflected the new interest aroused in lode mining as a result of development work on an asbestos deposit northwest of Dawson and the resumption of activity on a nickel-copper deposit in the White River area.

Tremendous interest has been shown in the oil and gas potential of a vast area west of the Mackenzie River Delta in the Northwest Territories and the Yukon.

An appreciation in land values in the Northwest Territories and the Yukon was noted, and although there was less timber cut owing to unfavourable marketing conditions, revenue exceeded \$170,000. Special consideration was given to the matter of unorganized development along the established highways in the Territories.

Mining¹—Northwest Territories and Yukon

Northwest Territories

The major part of mineral exploration activity was conducted in the Arctic and Hudson Bay Mining District, where 5,600 mineral claims were recorded. The total number of claims recorded for the Mackenzie and Yellowknife Mining Districts was 2,249, and for the whole of the Northwest Territories a grand total of 7,849 claims. This was the first time since the establishment of the mining districts that interest in exploration has been centred in the Arctic and Hudson Bay District. There was increased staking on the islands west of the Ungava Nickel Belt in the vicinity of Cape Smith and at the easterly extension of the Ungava Bay Nickel Belt on the islands in Wakeham Bay. Subsequently, claims were staked at Chorkbak Inlet, Lake Harbour, and Isortog Inlet on Baffin Island, and on Innetalling Peninsula, Flaherty Island and Turkaruk Island of the Belcher Islands, Hudson Bay.

Discoveries of iron, copper, nickel, and radio-active elements were reported. An estimated 400,000,000 tons of iron ore have been outlined at Chorkbak Inlet; in addition, a sulphide zone which may have copper-

¹ See Appendix B, Nos. 1, 2, 3 and 6.

nickel possibilities was discovered. A geological and geophysical survey was performed in the western section of Foxe Peninsula on southern Baffin Island. Exploration parties worked in the Eskimo Point area and along the west coast of Hudson Bay.

In the Yellowknife Mining District the greatest exploration activity occurred in the Coppermine River area. Fifteen companies explored for gold and copper in the district and staked 200 claims near Point Lake. The development road from Yellowknife to Rae was commenced and will eventually join the road being built from the Mackenzie Highway. Diamond drilling was done in the James River and Sloane River areas to investigate showings of copper at various locations.

Two mining companies performed considerable work south of Great Slave Lake. An interesting new find was made about one hundred miles northeast of Fort Resolution—lead, zinc, and copper occurring in fractured sandstones, reported to be approximately 2,000 feet in length.

Output is being maintained by the six producing mines—three gold, two uranium, and one nickel-copper—in which approximately 1,500 men are employed. At a potential gold-producing property, a shaft was sunk, and two levels were established where considerable lateral development in the ore zone took place with encouraging results. Further work is planned for the season of 1958 to evaluate ore reserves.

During 1958, it is anticipated that the emphasis of exploration work will be on gold and iron, with limited activity devoted to strategic minerals such as tantalum, niobium, and beryllium.

Yukon Territory

There was a reduction in exploration activity in quartz mining with many of the larger companies curtailing their field operations. This was due apparently to the decrease in base metal prices.

Development work was commenced on a deposit of asbestos northwest of Dawson City on a tributary of the Forty Mile River, and a nickel-copper property in the White River area was activated when underground operations were conducted to determine the ore reserves.

The principal producer in the Dawson Mining District operated dredges for placer gold on Bonanza, Hunker, Dominion, and Sulphur Creeks. Over six million cubic yards of gravel were dredged. The individual placer operator's production was low, owing to the water shortage during most of the season. Hydraulic operations were carried on in the Sixty Mile River Area, Miller Creek, Bedrock Creek, and Henderson-Thistle Creek area at Kirkman Creek.

The new asbestos discovery at Clinton Creek, as well as the original one at Cassiar Creek, is being developed. Bulk samples were trucked to northern British Columbia for analysis. Both projects are potential producers. As a result of these operations a feeling of optimism and

encouragement has been engendered among the people at Dawson, as this is the first occasion that a hard rock prospect has been developed to the point of actual mining.

The only operating mine in the Mayo Mining District, located at Galena Hill, produced silver-lead-zinc ore valued at approximately \$11 million. In spite of the decreased price of base metals, this mine has continued to operate because of the high silver content of the ore. Exploration for base metals was limited because of the depressed market conditions.

The only producing mine in the Whitehorse Mining District is the coal mine at Carmacks. During the past season, there was an increased demand for coal in Whitehorse.

A nickel-copper deposit is being developed in the White River area where a two-compartment vertical winze was completed 350 feet below the adit level; an aerial tramway was erected and a mining camp established near the Alaska Highway. To facilitate the movement of trucks to a point near the mine portal, an access road was also constructed. When arrangements for hoisting ore have been completed, development work will proceed on the existing two levels.

The former gold producer in the Mount Freegold area is being re-worked. This property is known to contain values running as high as one and one-half ounces of gold per ton.

There was some base metal activity in the Ross River and Upper Liard River areas, and at Aishihik Lake where molybdenum is known to exist. Exploration parties visited the Wheaton River area, where antimony has been found. Placer operations on Burwash Creek yielded 1,183.37 ounces of gold, and 452.46 ounces were produced from other locations in the district.

Oil and Gas—Northwest Territories, Yukon, and the Provinces

Northwest Territories and Yukon

Four public competitions were held during 1957–58 for the acquisition of 62 Territorial Oil and Gas Exploratory Permits in the Northwest Territories, from which 45 permits were granted as a result of these sales.

A total of 211 Territorial Oil and Gas Exploratory Permits covering an area of 11,190,159 acres in the Northwest Territories and 193 Territorial Oil and Gas Exploratory Permits covering an area of 8,417,788 acres in the Yukon Territory were granted up to the 18th of September, 1957. Pending the revision of the Territorial Oil and Gas Regulations, no new permits were issued after the 18th of September, 1957, and from that date until the 31st of March, 1958, applications for 325 permits in the Northwest Territories covering 13,757,645 acres, and 106 applications in the Yukon Territory covering 4,988,645 acres, were received.

In the Yukon Territory one well was drilled to a depth of 8,400 feet in the Eagle Plain Reservation, and in the Northwest Territories a total of five wells were drilled. However, commercial production was not attained in

any of the wells drilled during the 1957 season, although all the wells succeeded in providing considerable information on potential oil strata.

During the summer 18 surface geological parties, 2 aeromagnetic survey parties, 1 surface gravimetric party, and 1 seismic party were active in the Yukon and Northwest Territories. Geological parties, directed by oil consultants, worked for individual permit holders as well as for some of the major oil companies conducting exploration activities.

Provinces

Six public competitions were held for the purchase of leases of the oil and gas rights underlying 22 parcels in Manitoba, 22 parcels in Saskatchewan, and 45 parcels in Alberta. As a result of these competitions, 22 leases were granted in Manitoba, 21 leases in Saskatchewan, and 30 in Alberta.

Royalties were received from 3 wells in Alberta, 7 wells in Saskatchewan, 9 wells in Manitoba, and 2 wells also situated in Manitoba, in which the Crown owns a partial interest.

Lands and Timber¹

Northwest Territories and Yukon

Lands

Northwest Territories

The development of planned townsites at Fort Smith and Inuvik (Aklavik East 3) is still proceeding, and until such time as this planning has been completed, all vacant lands in both settlements have been withheld from sale. The effect of the withdrawal is indicated in the substantial reduction in the number of land sales completed and agreements of sale executed during the year.

Yukon Territory

In accordance with recommendations made by the Interdepartmental Committee on Federal-Territorial Financial Relations, all lots in a large addition to the City of Whitehorse were transferred to the Government of Yukon Territory without charge. The sale of lots in this subdivision has already brought to the Territorial Government revenue amounting to approximately \$150,000. During 1957-58, subdivisions at Miles 923 and 925 of the Alaska Highway were also transferred to the Territory. Revenue derived from the sale of these transferred lands is not included in this report.

During the year, surveys were completed for subdivisions at Watson Lake Junction and at McRae. When the survey plans have been completed, these subdivisions will also be transferred to the Territorial Government.

Timber

Although the number of permits issued for 100 cords or less almost equalled the number issued during the preceding year, permits for the

¹ See Appendix B, Nos. 3, 4.

larger commercial type of operation decreased considerably, with a corresponding drop in the volume of timber cut. This is attributable to the effect of the prevailing unsatisfactory condition of the lumber market.

Additional sawmill facilities, installed during the year by commercial operators cutting in Wood Buffalo Park, are not expected to be fully utilized until marketing conditions show a substantial improvement.

The reduction in the volume of timber cut during the year is not reflected in the amount of revenue received, as payments for a considerable quantity cut during the final quarter of the 1956-57 fiscal year are reported this year.

The increased use of oil for heating purposes in the larger settlements is expected to affect the consumption of fuelwood.

Public Lands in the Provinces

Public Lands

Most of these lands were former Ordnance and Admiralty Reserves which are no longer required for defence purposes and have been made available for lease or sale under the Public Lands Grants Act, 1950, and Regulations. A number of these properties have been reserved indefinitely for the Department of National Defence against future military commitments but have been leased when possible to place them on a revenue-producing basis. Considerable research is being carried out to verify the chain of title to these properties, many of which were acquired as early as 1755 by the Imperial Government by right of conquest, Vesting Acts of the Provincial Legislatures of British North America, and purchase under Deeds of Sale which are not available in the department's records. The remainder of these properties are former Public or Dominion Lands, which were declared surplus to the requirements of other government departments and returned to this Department for administration and disposal.

Fifteen outright sales were negotiated, and 8 other parcels of land were disposed of under Agreements of Sale. Letters Patent were issued for 30 properties, and 21 Agreements of Sale and 88 Leases are now in force, with an undetermined number of vacant properties to be investigated as possible revenue-producers. Land record cards and sketch plans prepared totalled 276, covering lands under the administration of the various branches of the Department, for submission to the Crown Land Registry of the Department of Public Works, and numerous inquiries concerning federally owned lands were referred to the Registry. Reports were submitted to the Department of Finance on departmental lands and buildings, which are subject to the payment of municipal grants in lieu of taxes.

Dominion Lands Records

Pursuant to the provisions of the Natural Resources Agreement of 1930, considerable work was done on transferring records relating to Dominion Lands to the provinces concerned. A total of 5,308 applications for Letters

Patent were examined, listed, and shipped to the provincial authorities, together with 21 cartons of Mining Lands files and several Land Registers; 157 certified true copies of Letters Patent were prepared on request, and 68,433 Letters Patent were indexed according to land description. Over 2,100 letters and telephone inquiries were answered concerning Hudson's Bay Lands, Railway Lands, School Lands, Half-Breed and Military Bounty Scrip, mineral rights and naturalization and old age pension entitlement.

Seed Grain, Fodder, and Relief Indebtedness¹

The Seed Grain Advisory Board made recommendations relating to 1,670 accounts for advances of seed grain, fodder, and relief made to homesteaders and settlers in Western Canada. As a result of these recommendations, \$18,908.18 was collected; \$487,582.11 in principal and interest was written off; and 3,339 liens were discharged. At the close of the year, there were 589 Federal and 637 Joint Federal-Provincial accounts still outstanding, which are well secured and should be collectible through negotiation.

Works Research and Planning Division

Mackenzie District, Northwest Territories

The largest single project was the work done on the extension of the Mackenzie Highway from Hay River to Yellowknife. About 52 miles of road construction was completed, bringing the highway as far as Fort Providence from the southerly end, and completing it by a rough standard to some 8 miles from the Yellowknife end. Surveys for the remainder of the work were completed. Expenditures for this project were about \$2.2 million. Surveys for other roads in the area, for which construction is planned in 1958-59 were completed. Minor road construction was carried out throughout the area.

Construction and improvements to buildings in this district amounted to \$6.5 million. Major work was the construction on the school and hostel program, which saw the completion of the Fort Smith project, the continuation of the Fort McPherson project, and the start of the Yellowknife and Aklavik projects. Other construction included several departmental housing units, smaller schools, maintenance garages, offices, a warehouse, and an abattoir.

Districts of Keewatin and Franklin, N.W.T., Northern Quebec and Churchill

Construction work extended for 1,000 miles across the Arctic from Cambridge Bay to Pangnirtung, with the greatest activity centred around

¹ See Appendix B, No. 7.

Frobisher Bay on Baffin Island, Cambridge Bay on Victoria Island, and Churchill. Construction operations were also carried out to extend the buildings and facilities in nine settlements and in new work in six additional settlements. The construction work included the following:

Frobisher Bay—6 houses for departmental officers, 16 houses for Eskimo residents, vocational workshop, warehouses, power supply, streets.

Cambridge Bay—Two-classroom school, garage and workshop, power plant, warehouse, and 5 houses.

Churchill—17 houses for departmental officers and Eskimos, transit centre, warehouse.

Great Whale River—Conversion of General Purpose Huttings to 4 houses for departmental officers, two-classroom school, community hall.

Yukon Territory

Total construction in the area amounted to some \$650,000, of which about 90 per cent was spent on roads and bridges and the rest on buildings. The steel highway bridges over the Mayo River and Crooked Creek were completed. Work started on the re-opening of the Canol Road from Johnson's Crossing to Ross River. Departmental houses were built at Dawson, Haines Junction, and Mayo.

Education Division¹

The ultimate aim of the Department in the field of education is the provision of basic elementary education for all children in the Northwest Territories, and advanced academic or vocational education for students and adults with special aptitudes. This program is being developed by the construction of additional federal day schools and hostels, by providing an increased number of bursaries and other aids for students, and by the development of special curricula for northern schools.

The Department operated 29 schools classified as "Federal Schools", 14 of which were primarily for Eskimo children. The Department also assisted 4 residential schools and 6 hospital schools, by grants, supplies, and, in some cases, by supplying the teachers. In addition, the Department furnished supplies and made grants to 18 schools operated on a part-time basis by missionaries. Schools operated throughout the year were attended by some 3,100 pupils. The part-time schools were attended by approximately 500 pupils. Some 1,500 Eskimo children received schooling on either full-time or part-time basis.

A permanent school hostel at Chesterfield Inlet for Eskimo children from the Central Arctic was operated by the Roman Catholic Mission. At Coppermine a tent hostel for Eskimo children from outlying areas was

¹ See Appendix B, No. 5.

operated by the Anglican Mission. These hostels were operated in conjunction with the local federal schools. At Fort Smith a new 200-pupil hostel and a new 14-classroom school went into operation at the beginning of January 1958. Pupils who had been maintained in the Roman Catholic Mission Residential School at Fort Resolution up to that time were transferred to the new hostel at Fort Smith for attendance at the new school, and the Mission School at Fort Resolution was closed. The Department provided the teachers for the patients in the six hospitals in the Mackenzie District.

Arrangements were continued for the maintenance and education of Eskimo and Indian children in the Anglican and Roman Catholic Residential Schools at Aklavik, N.W.T., for Indian children in the Roman Catholic Residential Schools at Fort Providence and Fort Resolution, and for Eskimo children in the Anglican Residential School at Fort George, Que. In 16 settlements in the Northwest Territories and Northern Quebec, schools were conducted on a part-time basis by missionaries of the Roman Catholic and Anglican mission organizations, 12 by the former and 5 by the latter. A part-time school was conducted by the Canadian Interior Mission at Maguse River, N.W.T., and by an Eskimo at Resolute Bay, N.W.T.

In the District of Mackenzie a total of 34 schools were in operation with a total enrolment in March 1958 of 2,486 pupils. According to racial origin, 1,290 pupils were of white status, 821 were Indian, and 375 were Eskimo. Of these pupils 1,262 were boys, and 1,224 were girls. Summer schools for Indians were conducted at Lac la Martre, Fort Wrigley, and Nahanni Butte.

In the District of Keewatin, 7 schools were in operation, 3 of which were on a part-time basis only. In the District of Franklin 13 schools were operated, 9 of which were conducted for only part of the year. Along the coast of northern Quebec, where Eskimos are located, the Department operated 4 schools and maintained 7 Eskimo pupils in the Anglican Residential School at Fort George. The Roman Catholic mission organization conducted 4 schools on a part-time basis.

In the field of vocational training, 302 persons benefited through the media of training on-the-job, by local programs and apprenticeship, and in Technical Institutes. Some 51 vocational fields were covered. In order to meet construction requirements in the North and also mechanical demands, greater emphasis was placed on local training programs, building construction, carpentry, electricity, and plumbing. These programs were carried out at Aklavik and Fort Smith.

The Leduc Training Program for Eskimos in operation and maintenance of heavy equipment, which made up 136 of the 302 persons trained, was greatly accelerated.

A highlight of this year's program was the Food Service Course given at the Provincial Institutes of Technology and Art, Calgary, Alta., where 21 girls received training in the preparation of food and as waitresses for employment in construction camps at Aklavik.

National Parks Branch

Administration of the National Parks is carried on by four divisions: the National Parks Service, the National Historic Sites Division, the Engineering Services Division, and the Canadian Wildlife Service.

National Parks Service¹

Canada's National Parks system was extended by the establishment of Terra Nova National Park in Newfoundland. Title to approximately 156 square miles on the Atlantic Coast was provided by the Provincial Government, and the area was formally set aside as a national park by proclamation on May 11, 1957. The new park is bounded on the north by the northeast arm of Alexander Bay, on the east by the shores of Newman Sound and Bonavista Bay, on the south by the northern shore of Clode Sound, and on the west by a line from Platter Cove on Clode Sound to the east end of Pitts Pond and thence northeasterly to the shores of Alexander Bay east of Traytown. The headquarters of the park have been established at the head of Newman Sound, and a program of development has been inaugurated.

New attendance records were established in the national parks when visitors totalled 3,940,711, an increase of 410,735 over the previous year. The most substantial gains were registered at Banff, Jasper, and Waterton Lakes Parks in Alberta. A very substantial increase was also indicated at Riding Mountain Park in Manitoba, and increased patronage was also evident in Mount Revelstoke, Elk Island, and Fundy Parks.

The park highway improvement program, which was continued on a wide scale, entailed the expenditure of a substantial part of the funds voted by Parliament for national parks purposes. Further progress was made in the construction of the Trans-Canada Highway through Banff and Yoho Parks and in the reconstruction of the Banff-Jasper and Banff-Windermere Highways. A hard surface base course was laid on the Trans-Canada Highway to Mile 29.2, and the new road was opened up for traffic to Mount Eisenhower Junction. The Gulf Shore Road between Dalvay and Cove Head Harbour in Prince Edward Island Park was completed and surfaced with asphalt, and a bridge at Cove Head Harbour erected.

Early in 1958 a special program to provide winter employment for residents of the parks and adjacent communities was instituted in most of the larger national parks across Canada. In the mountain and prairie parks, the work consisted largely of right-of-way clearing of trunk highways and roads providing access to scenic attractions. Sanitation cutting of highway fringes was also carried out. In the maritime parks, projects were set up to provide additional tourist accommodation including the following: a campground in Cape Breton Highlands Park; a motel and bungalow camp development in Fundy Park; and a bungalow camp development in Terra Nova

¹ See Appendix C, Nos. 1 to 4.

Park. The projects were started by January 10 and were in full operation by mid-February, at which time over 1,400 men were employed.

A special planning section was established within the National Parks Branch to make studies and recommendations on park use and development in accordance with present and future needs. The section is responsible for gathering data and preparing plans for the development of each unit of the National Parks system on a long range basis. This is essential if facilities are to be developed to meet the increasing pressure and at the same time to ensure that, as far as possible, the parks are preserved in their natural state for the benefit of future generations. Development inventories for each park were undertaken, recommendations on basic park policies were prepared, and steps were taken to organize an aerial survey program.

A number of projects were undertaken in the national parks, both by the National Parks Service and by private enterprise. The construction of a 45-bed hospital in Banff was completed by the Sisters of Saint Martha, and a start was made on the erection of a large hotel in the town of Jasper. An 18-unit motel was constructed in Waterton Lakes Park.

Improvements were carried out to camp-grounds and picnic facilities. In Banff Park, work was nearly completed on the first block at Tunnel Mountain camp-ground, which will provide individual water, sewer, and electrical services for eighty-seven trailers. A number of additional kitchen shelters were erected at various camp-grounds.

Several improvements were made to park townsite streets. Complementing the construction of Banff Avenue, new water hydrants were installed, and good progress was made by the Alberta Government Telephones, Calgary Power Company, and Canada Western Natural Gas Company in placing their services underground. Other street improvements were carried out in Banff, in Jasper Townsite, and in Wasagamung Townsite in Riding Mountain Park.

Golf, bowling, and tennis tournaments were held in Prince Albert and Riding Mountain Parks. In Banff Park the annual Banff Indian Days celebrations were held from July 18 to 21. Winter sports events included the International Collegiate Ski Meet, the annual Banff Bonspiel, and the Banff Winter Carnival.

A Mountain Climbing and Rescue School held two sessions at Cuthead Creek, October 1 to 6 and October 9 to 14. There were thirteen park wardens and four members of the Royal Canadian Mounted Police at each session. A ski and winter rescue school was held in Banff Park from February 10 to 22 with sixteen park wardens and eight members of the R.C.M.P. in attendance.

Fire danger measurement stations were operated during the fire season in Banff, Jasper, Yoho, Waterton Lakes, Prince Albert, Riding Mountain, Fundy and Cape Breton Highlands Parks. Field inspections by the Forest Insect and Disease Survey of the Forest Biology Division of the Department of Agriculture were carried out to check on the status of dangerous forest

insect and disease conditions. A limited spraying operation to control spruce budworm damage was carried out in selected areas of Cape Breton Highlands Park with the assistance of the Department of Agriculture's Forest Biology Division.

Forest fire losses from 29 forest fires, which burned 1,313.3 acres, amounted to \$1,026 in timber value. Of the total number of fires, lightning caused 8; various public works, particularly highway slash-burning operations, 7; camp-fires and smokers, 6; railway operations, 3; miscellaneous human agencies, 3; and 2 fires were of unknown origin.

To conserve grazing areas, overabundant animal populations were reduced in Banff, Jasper, Elk Island, and Waterton Lakes National Parks. During the fiscal year 622 elk and 53 moose were killed, and the meat and hides sold by tender or donated to the Indian Affairs Branch. At Point Pelee Park 1,600 muskrat were trapped and pelted, and the hides sold by tender.

Approximately 756,000 grayling and 14,000 pounds of trout of various species were raised in park hatcheries and distributed in park waters. Riding Mountain Park waters were stocked with rainbow trout, and eastern brook trout were supplied by the Manitoba Fisheries Branch. Salmon and brook trout, released in Cape Breton Highlands, Prince Edward Island, and Fundy Parks, were supplied by the Department of Fisheries. A generous supply of trout, white fish, and grayling eggs was donated to the National Parks Service by the Manitoba and Saskatchewan Fisheries Branches.

The decision to construct a portion of the Trans-Canada Highway through Glacier and Mount Revelstoke Parks led the Department to establish headquarters for these parks under a separate Superintendent, with headquarters at Revelstoke, B.C. Heretofore these Parks, together with Yoho Park, were administered by one Superintendent with headquarters at Field.

National Historic Sites Division¹

The National Historic Sites Division is responsible for the operation and maintenance of 20 national historic parks and for the care and preservation of more than 550 national historic sites and plaques erected throughout Canada. The Historic Sites and Monuments Board of Canada, an honorary body of representatives from each province, advises the Minister on the commemoration of persons of national historic importance and on the marking or restoration of places, buildings or structures of national interest by reason of age or architectural design.

During the year the Cartier-Brébeuf Park was acquired from the City of Quebec, and improvements will be commenced in 1958 on this newest National Historic Park. Negotiations regarding acquisition of land were continued at Grand Pré and Baddeck, N.S., Signal Hill, Nfld., and Fort Langley, B.C. The program of erecting memorials to mark historic places,

¹ See Appendix C, Nos. 12 and 13.

events, and prominent figures in Canadian history was continued with markings in Pictou, N.S.; Fredericton, N.B.; Ottawa, London, and Owen Sound, Ont., and Fort McLeod (McLeod's Lake), B.C.

Engineering Services Division

The Engineering Services Division, in co-operation with offices of its Supervising Engineers and staffs in Banff, Alberta, Halifax, Nova Scotia and Ottawa, Ontario, designed structures, municipal utilities, and other engineering and architectural requirements for the National Parks Service and the National Historic Sites Division. Technical advice on engineering, architectural and landscaping matters was also provided for the Branch.

Numerous plans were prepared for the Parks Branch. The plans were made by aerial mapping methods and also ground survey techniques. These surveys and plans provided information on existing structures and facilities, as well as projected proposals for site and development planning and of roads, utilities, boundary lines along with other requirements.

The Engineering Services Division prepared technical specifications and reviewed tenders required for the purchase of heavy road building machinery, power operated equipment for machine and carpenter shops, building construction materials together with a great variety of commodities required by the Parks Branch in operation and maintenance.

The architectural designs of buildings and structures planned for erection in the national parks by private concerns were examined.

A landscaping section has been added to the Division. This section attends to landscape planning for future projects, together with undertaking improvements in landscaping generally throughout the national parks of Canada.

Major projects beyond the resources of the Engineering Services Division, such as major highway and bridge works and large structures, were handled for the Branch by the Department of Public Works. Preliminary requirements such as site plans and architectural sketches were prepared for most of the works undertaken by Public Works on behalf of the Branch.

Canadian Wildlife Service¹

Waterfowl breeding conditions and waterfowl populations were again studied throughout all the provinces and territories in co-operation with provincial and other game agencies. Co-operative studies were also engaged in with the U.S. Fish and Wildlife Service. Factors affecting the production and survival of ducks were investigated in detail, and work was continued on the problem of waterfowl damage to crops.

A waterfowl kill survey was conducted by mail in Manitoba, Quebec, and Nova Scotia.

¹ See Appendix C, Nos. 14 to 16,

Surveys and spring counts of Wilson's snipe and woodcock were carried out in the eastern provinces, and the status and behaviour of the two species were studied.

Among the investigations completed were a number dealing with northern bird conditions. At a banding station on Mills Lake, Mackenzie River, more than 2,150 ducks were banded, and more than 2,300 brant were banded on Southampton Island. A survey of the potentialities for eider duck production was begun at Lake Harbour, Baffin Island. The life history and ecology of a colony of murres at Cape Hay, Bylot Island, were investigated. On the southwestern part of the same island, studies were completed on the breeding behaviour of the greater snow goose. The life history, utilization, and kill of blue and lesser snow geese in James Bay were also studied.

Organization of banding programs and participation in them were continued during the year. A total of 122,877 records of banded birds were received and processed during 1957.

Administration of the Migratory Birds Convention Act was continued in conjunction with the Royal Canadian Mounted Police and in co-operation with the provincial game branches. Five new sanctuaries for migratory birds were established under the Act. The total number of the sanctuaries is now 95, and their total area more than 5,006 square miles.

Among projects concerned with mammals, the most important was an intensive caribou research program, which was begun in April, 1957, and continued throughout the year. Data were collected on many phases of caribou biology, including reproduction, herd composition and movement, and mortality. A range management officer and a pathologist were added to the staff, and studies of winter ranges and of diseases and parasites of the caribou were initiated. A predator control officer was appointed for the Northwest Territories, and research concerning wolves was continued.

Other mammal investigations included studies of musk-oxen on the Thelon Game Sanctuary, of Arctic foxes on Baffin Island, and of bison in Wood Buffalo National Park. A preliminary survey of the game resources of the South Nahanni River area and a reconnaissance of the game and fur resources of the Yukon Territory were conducted.

Three limnologists and a summer assistant were engaged in surveying lakes and streams in the national parks and in carrying out management procedures. Again in 1957, several lakes were treated with chemicals to eliminate all fish life, especially coarse fish, for later restocking with trout or grayling. Similar operations in past years have successfully improved the angling. Further studies of general hatchery operations and procedures have been conducted with special reference to quality of water, rearing units, and artificial diets. Field tests of methods for control of black flies, mosquitoes, and aquatic vegetation were made. Assistance was given in the revision of regulations governing angling in the parks, and in the discussion of fisheries matters in the Northwest Territories.

Water Resources Branch

The Water Resources Branch contains two Divisions: Operations, which is responsible for most of the basic Branch functions, and Hydraulics, which is responsible for special studies required in the solution of waterway problems referred to the Branch. The Branch Director and senior engineers are active members of numerous federal-provincial and international engineering boards and boards of control established to deal with waterway questions. In addition, the Director is a member of the Northern Canada Power Commission.

The Branch conducted the systematic hydrometric survey program throughout Canada, studied and analysed problems involving waterways of federal-provincial and international concern, compiled the power resources inventory of Canada, and administered legislation concerning international rivers, water power, and water conservation.

The Branch co-operated with public and private agencies in water-power and water-supply problems, in the maintenance of gauging stations, and in the performance of hydrometric surveys and investigations of mutual concern. Through its Director as Honorary Secretary of the Canadian National Committee, World Power Conference, the Branch participated in preparations for the Canadian Sectional Meeting of that Conference in September 1958. Certain gauging stations of international interest were operated in co-operation with the appropriate United States Government agencies. Special investigations were carried out this year in connection with Lake Ontario and with the Columbia, Fraser, Yukon, and St. Lawrence Rivers.

Hydrometric Surveys¹

Conduct of the systematic hydrometric survey program comprises a major part of the Branch activities. As a part of the maintenance of 1,219 gauging stations, field operations included 6,519 stream discharge measurements and 2,170 additional inspections of gauging stations by the technical staff.

Records compiled from operation of the hydrometric survey program are published in biennial Water Resources Papers, each of which covers one of the four main drainages of Canada. The paper covering the Pacific drainage was issued this year.

The Current Meter Rating and Experimental Station is located at Calgary and was operated for the repair and calibration of current meters and related equipment as well as for investigation on new types of pertinent instruments. Its services were made available to other organizations.

Based upon the flow records from 23 typical rivers distributed across Canada, a monthly statement covering stream-flow conditions in Canada was

¹ See Appendix D on "Details of Stream Gauging" and "Snow Surveys".

released to the public early in each month. The flow records were supplied also to the United States Geological Survey at Washington, which publishes a monthly summary of stream flow throughout North America.

For Canada as a whole, total runoff for the year was moderately above normal, the average for the 23 typical rivers being 127 per cent of their median flow. Well-below-normal flows occurred during the spring of 1957 in Nova Scotia, New Brunswick, Quebec, and in southern Ontario, and during the summer in southeastern British Columbia and on the eastern slopes of the Rocky Mountains. Elsewhere, river flows were generally near or above normal with well-above-normal runoff, in most districts, late in the autumn or in the winter. At Beauceville, Quebec, flooding of the Chaudière River occurred on December 21 as a result of ice jams coincident with relatively high runoff; extreme high flows also occurred in the Carrot River basin in Saskatchewan and Manitoba during the spring runoff, 1957.

On several rivers subject to dangerous floods, frequent observations of stage were obtained, and a flood warning service was provided during danger periods. Commencing the first of May each year, water levels at 26 key locations in the Columbia River and Fraser River basins were made available to the public by the Vancouver district office. From a study of river conditions in the upper reaches together with current meteorological data, a day-by-day computation of probable stages in the lower reaches of these rivers was made available. Co-operation with United States authorities was maintained with respect to determining probable stages on the lower Columbia River. From daily observations at about 16 locations, the Calgary office forecast stages on the North and South Saskatchewan Rivers and transmitted the information to Edmonton, Medicine Hat, Saskatoon, Prince Albert, and to provincial authorities in Alberta, Saskatchewan, and Manitoba; it also participated in the work of the Bow River Ice Committee in alleviating the flood hazard on the Bow River. The Winnipeg office co-operated with local authorities in the Red and Assiniboine Rivers flood forecasts.

For the purposes of estimating the amount of spring runoff, annual surveys of the water content of snow cover were made on typical courses in important drainage basins. Although no glacier surveys were carried out this year, biennial surveys were made of several representative glaciers in British Columbia and Alberta.

Waterway Problems and Water Power Administration¹

Personnel of the Branch served on twenty-three international and four federal-provincial boards, which were established to study problems relating to the control of boundary or other waters. The District Offices of the Branch

¹ See Appendix D on "Boards on which Water Resources Branch Has Membership", "Developments Under Dominion Water Power Regulations", and "Technical Assistance to Federal Agencies".

assisted other federal agencies by the provision of engineering advice with respect to specific water problems and by providing administrative assistance with respect to certain federal lands.

The Branch continues to provide technical advice to the Department of External Affairs and to the Canadian Section of the International Joint Commission in their considerations and studies of international waterway problems which have arisen on various rivers across Canada. Among the most important studies of this nature undertaken by the Branch are those of the Columbia and Fraser Rivers. These two river systems comprise the bulk of the drainage for the whole of southern British Columbia, and their topography has permitted consideration of their interconnection by diversion from the Columbia River to the Fraser River system. Various possibilities for separate or combined development of these two major river systems are being given careful scrutiny.

The Branch participated in an extensive study of the regulation of Lake Ontario to determine the most effective use of storage on the lake in the operation of the St. Lawrence power project in the International Rapids reach of that river and the Seaway project from Lake Ontario downstream to Montreal. Existing cultural development and the narrow limits of river regimen permissible from Lake Ontario downstream past Montreal combine to make this study a most involved one.

The Yukon River has been the subject of previous study to determine the possibilities of diversion of its upper reaches into the Taku River system for power production in Northwestern British Columbia. Since the Yukon River with its tributaries constitutes the bulk of the drainage system of the Yukon Territory and hence is a federal responsibility, the Branch continued its power resources reconnaissance survey, initiated in 1956. When this work has been completed, it will be possible to provide a reliable estimate of the power potential of the Yukon River system which might be developed within the Yukon Territory.

An important part of Branch activities is the provision of technical assistance in investigations and studies being conducted on a joint federal-provincial basis.

The Branch continued its participation in the studies being made under the direction of the Fraser River Board to determine the possibilities of general Fraser River basin development with particular reference to flood control and hydro-electric power generation. This Board was established by the Governments of Canada and British Columbia, and in 1956 it submitted an interim report covering investigations to that time; it is to complete its preliminary report late in 1958.

The Lakes Winnipeg and Manitoba Board was established in 1956 by the Governments of Canada and Manitoba to investigate and report upon the possibilities of further development and control of the resources of waters within Manitoba flowing into and from those lakes, with particular reference

to flood control and hydro-electric power generation. The Branch continued its participation in the studies being made by this Board, which expects to submit a report to the two Governments in 1958.

The foregoing brief references outline several of the many Branch activities in the field of waterway matters. Further activities are summarized in Appendix D. An additional function of the Branch was the administration of the Dominion Water Power Regulations, which included the inspection of developments made under their authority and the collection of rentals.

The Branch conducted its activities relevant to its responsibilities for the administration of the International River Improvements Act and Regulations and the Canada Water Conservation Assistance Act. Annual reports detailing the Branch activities in this respect are tabled in the House of Commons.

Based on the Branch's hydrometric surveys and investigations and other data, the current estimate of the water-power resources of Canada is 66,203,000 h.p. at ordinary six months flow. During 1956, new hydraulic installations totalled 1,546,560 h.p., bringing the installed capacity of all water-power developments in Canada to 19,891,008 h.p. New stations and extensions under active construction for operation in 1958 were estimated at about 2,200,000 h.p.; others with a total capacity of approximately 4,300,000 h.p. were under preliminary construction or were definitely planned.

Three regular annual water-power bulletins were issued during the year, and water-power articles were revised for several publications of other agencies.

Forestry Branch

The Forestry Branch carried out programs of research directed toward the improvement of forest management and the utilization of forest products. It is responsible for the administration of agreements with the provinces through which federal financial assistance is extended for certain forestry activities carried on by provincial departments. During the year a Forest Management Section was established within the Operations Division of the Branch to conduct forest surveys and formulate management plans for forests administered by this department and other departments of the Federal Government.

The Forestry Branch is organized in three divisions, namely, Forest Research Division, Forest Products Laboratories Division, and Forestry Operations Division. In addition, there are separate sections dealing with Forest Economics and Branch Administration.

The new Forest Research Laboratory at the Petawawa Forest Experiment Station was formally opened and brought into operation during the year. New Forest Products Laboratory buildings at Ottawa and Vancouver, and a new Laboratory building at Pointe Claire, Quebec, for the use of the Pulp and Paper Research Institute of Canada, were completed.

*Forest Economics*¹

The Forest Economics Section carried out research in problems concerning the allocation, development, and utilization of Canada's forest resources. It studied the economic implications of forestry legislation; compiled up-to-date information for the National Forest Inventory; and analysed statistics on production, distribution, consumption, and trade in forest products. It served in an advisory capacity to the Director and to other units of the Department in all matters of economic policy. The Section maintained close liaison with the Dominion Bureau of Statistics and other government agencies in the improvement of forestry statistical methods. It was represented on the recently formed Interdepartmental Advisory Committee on Forestry Statistics.

The Section provided statistical and economic data on production and trade in forest products for the international reports of the specialized agencies of the United Nations. Assistance was also given to the Technical Co-operation Service of the Department of Trade and Commerce in providing courses of instruction for forestry trainees under the provisions of the Colombo Plan and the Expanded Technical Assistance Programme.

The Chief of the Section served on the Interdepartmental FAO Committee and represented the Department as forestry adviser on the Canadian Delegation to the Ninth Session of the FAO Conference held in Rome in 1957.

¹ See Appendix E, Nos. 1 to 3.

Forest Industries

Canada's forest industries in 1957 were affected by the general worldwide over-production of raw materials. A decline in both trade and output was further influenced during the last half of the year by the slackening of business activity in the United States and Canada.

In the lumber industry, output fell to an estimated 6.8 billion board feet in 1957, or about 12 per cent lower than in 1956. Exports of lumber to the United States were down 19 per cent in value, largely as a result of curtailments in housing construction. This decline, however, was partly offset by a modest increase in exports to the United Kingdom.

Although the capacity of the pulp and paper industry continued to increase, the output of 10.2 million tons of wood-pulp in 1957 represented a reduction of 5 per cent from the previous year. Newsprint output, on the other hand, was only slightly lower than the record production of 6.5 million tons in 1956.

In 1956, total utilization of forest products amounted to 3,461 million cubic feet, an increase of more than 5 per cent over 1955 and 12 per cent over the average for the 10-year period 1946 to 1955.

Forest Research Division¹

Research activities included fact-finding surveys to evaluate existing conditions, fundamental studies concerning the characteristics and behaviour of forest species and the influence of different factors of their environment, and applied research to develop practical methods for influencing forest development and improving operating and research techniques.

The Forest Research Division conducted research in silviculture, management, ecology, tree physiology, tree improvement, and reforestation from six district offices located at Calgary, Alta., Winnipeg, Man., Ottawa, Ont., Valcartier, Que., Fredericton, N.B., and St. John's, Nfld., and at the Petawawa Forest Experiment Station. Research in forest inventories methods and in fire protection was conducted by two sections located at Ottawa.

Silviculture and Related Research

Silviculture deals with the theory and practice of controlling forest establishment, composition, and growth, while forest management is concerned with the application of business and technical principles to the operation of forest properties in order to achieve continuous production, with the net growth and harvest in approximate balance.

The principal tasks within this field of forest research are as follows:

1. Development of satisfactory systems for classifying forests and forest sites as a basis for proper silviculture and management. This includes a study of physiographic and edaphic features, lesser vegetation, and the forest itself.

¹ See Appendix E, Nos. 4 and 5.

2. Determination of the silvical characteristics of Canadian tree species and the ecological relationships of the associations in which they occur. Included are fundamental studies of plant growth as related to such factors as temperature, light, moisture, frost, and studies of succession, all of which determine the character of the forest.
3. Development of methods of silviculture applicable to the more important forest types and to Canadian economic conditions. Studies are concerned with economic and practical harvesting methods for existing forests and experimentation to ensure future forests of desirable species.
4. Development and testing of practical methods for the actual and potential growth and yield of forests. An assessment of the potential productivity of forest sites and an accurate prediction of future yields of forests are essential for long-term management.
5. Development of improved techniques for reforestation and of improved strains of tree species suitable to Canadian conditions. Included are studies for the improvement of planting, seeding, and nursery techniques, and the development through selection and hybridization of better trees for use in reforestation programs.
6. Improvement of methods of organizing forest data into plans of regulation and silviculture for forest areas suitable to different intensities of management. This provides not only technical information for the implementation of management, but also valuable demonstration of various intensities of management in commercially important forest types.
7. Improvement of research methods, mensuration techniques, and the design of experiments. Experimental designs are developed to ensure the validity of results, mathematical functions of growth developed, and mensurational techniques tested and improved.

In all districts, studies of forest and forest site classification were in progress to provide the basic framework within which both research and forest management must be conducted. Fundamental ecological studies, tree breeding, provenance studies, and research in tree physiology continued, with the major part of this work being done at the Petawawa Forest Experiment Station, Chalk River, Ontario.

Tests of silvicultural techniques, with emphasis on regeneration following cutting and fire, continued in all districts; basic data were obtained as a preliminary to the management of selected and representative forests in each district, and data collected as a basis for the preparation of yield tables for important species. Studies of different cutting practices were expanded to include additional important forest types. Requests continued from forest industries and provincial agencies for technical assistance in planning such applied experimentation.

Forest Inventories Research

Stand volume tables based on factors ascertainable from air photographs are being prepared to show the quantity of timber per acre in various forest types.

Methods of air photography are being developed to provide maximum forest information at minimum cost. Studies are being made of photographs taken with air cameras of improved design or with special films. Techniques

of controlling the blur that occurs because the air camera is on a moving platform are under investigation in relation to large-scale sampling photographs.

Instruments and other equipment for use in field surveys and for the interpretation of air photographs are being investigated and developed.

Research in the development of methods of field sampling with particular regard to co-ordination with information obtainable from the air photograph is being conducted.

Fire Protection Research

Many problems relating to the protection of forests against fire were studied. Most investigations were made at the request of provincial and other forest protection agencies, which often co-operate in the undertakings. All members of the staff of the Section are in Ottawa, though most of the technical officers spend the fire season in the field at forest experiment stations or at temporary fire research stations.

Two field parties were established in British Columbia, one on Vancouver Island and the other on the Cariboo Plateau of the interior, to obtain data for the preparation of fire danger tables for the province. Analyses of the field data obtained in Alberta and Saskatchewan for fire danger table preparation were nearly completed.

A study of control burning was completed, and the results were published. A manuscript on herbicides and soil sterilants used in fire control was submitted for publication. Other activities included experiments with back-pack pumps, studies of the effect of mountainous topography on some phases of fire control, and the production of a training film on fire detection and fire weather.

Forestry Operations Division

Under the Canada Forestry Act, the Division administered agreements between the Federal and Provincial Governments in the fields of forest inventory, reforestation, fire protection, and forest access roads and trails. In addition, federal participation continued in the spruce budworm aerial spraying program in New Brunswick. An agreement with the Province of British Columbia in 1957-58 provided financial assistance in a spraying program against the black-headed budworm on Vancouver Island.

A Forest Management Section has been added to the Division. It is responsible for conducting forest surveys and formulating management plans for forests in areas under federal jurisdiction, such as the northern territories and national parks. Under an arrangement with the Department of National Defence, forest fire protection and timber administration were provided at Camp Gagetown, N.B. A small education unit was also maintained.

Provincial Agreements¹

Forest Inventories

The federal-provincial agreements, executed under the Canada Forestry Act in 1956, provided for the completion of the initial forest inventories of the seven participating provinces by March 31, 1958, and for maintenance of the inventories until March 31, 1961. Under the terms of the agreements, the Federal Government pays half the cost of the approved programs.

In 1956-57 the initial inventories were completed in Alberta, Saskatchewan, Manitoba, and Nova Scotia, and last year the completion of the inventories in British Columbia, Ontario, and New Brunswick marked the attainment of one of the objectives envisaged when the first agreements were executed in 1951. The initial inventories of the participating provinces comprise a gross area of 1,129,000 square miles. A number of these reports have yet to be published.

In all provinces the work programs are now concerned with maintaining the inventories in a reliable state. This entails rephotography and revision of volume estimates, maps, and growth and depletion data.

Reforestation²

Under the agreements, the Federal Government contributes \$10 per thousand trees planted and \$1 per acre seeded to those provinces which maintain their reforestation programs at or above the previous three-year average. The Federal Government also contributes one-fifth of the cost of establishing and operating new forest nurseries.

Under a special agreement, Prince Edward Island receives 50 per cent of the cost of reforestation on waste lands unsuitable for agriculture.

In 1957-58 payments were made toward the establishment and operation of new nurseries in Ontario, Prince Edward Island and Nova Scotia. Saskatchewan, Manitoba, Nova Scotia, and Prince Edward Island planted 1,647,000 trees, and Saskatchewan seeded an area of 256 acres. Since 1951 the Federal Government has shared in the planting of 74,304,000 trees, the seeding of 7,262 acres, and the establishment of 11 new nurseries.

Forest Fire Protection

Five-year agreements were entered into with nine provinces to provide financial assistance for forest fire protection. A total of \$5 million in federal funds is to be made available during the period of the agreements for capital expenditures on fire prevention, detection and suppression equipment, buildings and improvements, and the hiring of aircraft and vessels.

¹ See Appendix E, Nos. 6 to 9.

² See Appendix E, No. 6.

The total federal allotment in 1957-58 was \$500,000; in 1958-59 it is to be \$750,000, and for the three years thereafter \$1,250,000 per year. The allotment to each province is dependent upon the province's expenditures on fire protection and also on its forested area.

*Aerial Spraying Operations—British Columbia and New Brunswick*¹

Under an agreement with the Province of British Columbia, the Federal Government contributed one-third of the cost of an aerial spraying project on Vancouver Island. The forest industries in the area and the Provincial Government each contributed a like amount. The spraying project was designed to combat a severe infestation of black-headed budworm on an area of about 150,000 acres containing approximately 3 billion board feet of mature timber.

Spraying was conducted in mid-June employing four aircraft operating from the Port Hardy airport. An over-all control of about 90 per cent was obtained, which was sufficient to prevent serious third-year defoliation and resulting heavy mortality. Late autumn surveys indicated a low overwintering population. No serious defoliation is expected next year.

Under the agreement with the Province of New Brunswick, federal participation continued in the spray program to combat the spruce budworm infestation. In 1957-58 a total of 5,195,000 acres were sprayed using 187 aircraft and 14 airfields. Operations were again conducted by Forest Protection Limited, a Crown corporation organized for the purpose. The Federal and Provincial Governments and the forest industries in the area contributed equally to the cost of the operation.

Investigations by entomologists indicate encouraging results from the 1957 spraying program. The egg populations in the sprayed area are the lowest encountered since the spraying began. Plans for 1958 call for the spraying of approximately 2.5 million acres at an estimated cost of \$1,800,000.

Forest Access Roads and Trails

Agreements were entered into with nine provinces under which the Federal Government contributes half the cost of constructing forest access roads and trails over the period January 2 to June 30, 1958. These agreements were implemented in recognition of the importance of good access in providing adequate forest fire protection and management.

Forest Management

Forest Inventories of Federal Lands

Provisional forest cover maps of 7,710 square miles in Jasper National Park, Wood Buffalo National Park, and the Northwest Territories were prepared from air photographs, and final revisions were made on 4,426 square miles of mapping previously reported as provisional.

¹ See Appendix E, No. 9.

During the summer of 1957, 623 field plots and 1,893 height-diameter measurements were taken as a step toward the preparation of detailed forest estimates of areas along the Peace and Athabasca Rivers.

In addition, forest surveys were made at Camp Ipperwash, Ont., and on rifle ranges at Prince George, B.C., Prince Albert, Sask., and Woodstock, N.B.

*Camp Gagetown, New Brunswick*¹

The Forestry Branch is responsible for forest fire protection and forest management on the 430-square-mile Camp Gagetown military area.

Construction was completed and occupancy taken of three new ranger stations in the villages of Gagetown, Brown's Flats, and Boyne.

Weather conditions in May and June were very dry, and twenty-one days of high fire danger were recorded in the two-month period. For the first time, live ammunition was employed in army manoeuvres, resulting in a number of small fires. Nine fires, which occurred within the boundaries of the camp area, burned thirteen acres of forest and four acres of non-forested land. Timber valued at \$253 was destroyed, and the cost of fire suppression was \$1,054.

Other Military Areas

The Forestry Branch supervised small timber sales at Camp Borden, Ont., and Camp Utopia, N.B. At Camp Borden, pulpwood from thinnings of pine plantations was the main product, while a small area at Camp Utopia was cut for sawtimber.

Education²

The dissemination of information on forests and forestry to the public was carried out through the media of publications and correspondence, photographs, films, and displays. Forty-nine new publications and two re-issues were distributed to a total of 86,000 pieces—an increase of nearly 30,000 over the previous year. More than a third of this number was distributed through schools and other organizations. Two thousand inquiries were replied to by individual letters.

The photographic library was increased by 235 black-and-white prints and 150 coloured slides. Ten of the former were supplied to outside publishers for reproduction in periodicals and pamphlets. To aid in the training of fire-fighting crews, a loan service of three training films was maintained.

Window displays were shown at the Forestry Branch Head Office, and with the co-operation of the Post Office Department, forest fire prevention posters were displayed in post offices across Canada.

¹ See Appendix E, No. 9.

² See Appendix G.

Forest Products Laboratories Division¹

At both the Ottawa and Vancouver Laboratories, considerable attention was given to research work, field studies, and investigations directly related to the basic conversion of timber to lumber and other products. Many competitive materials have made, and continue to make, serious inroads in lumber markets. It is therefore essential to the economic stability and continued development of forest-based industries that accurate research knowledge upon which to base more realistic conversion practices and utilization techniques should be available. To these ends, research has been continued in projects aimed at a fuller understanding of the mechanical, physical, and chemical properties of wood.

The utilization of wood residues continued to grow in importance, and much progress was made to meet the urgent need for research data related to a more complete and economic use of all wood substance available from Canada's annual forest harvest.

Veneers and plywoods continue to expand the fields of their uses. Research work has been aimed at the development of improved cutting, assembly, and bonding techniques and to preliminary evaluation of the suitability of Canadian timber species not now cut to veneer.

Laminations in many forms are being increasingly used as structural members in building construction, and to satisfy an expanding demand for data, many investigations have been carried out. Similarly, studies were undertaken on the fabrication and load-bearing ability of various types of nailed trusses and other structural forms.

The long-term program of research has been advanced, and additional fundamental and applied data have been secured. At both Laboratories, field investigations and laboratory research and studies have included timber engineering, plywood and adhesives, wood preservation, timber pathology, wood chemistry, logging and milling, lumber seasoning, and wood anatomy.

Research at the Ottawa Laboratory also extended to timber physics, containers, veneer cutting, the painting of wood, bark removal, and the fundamentals of lumber manufacture. Microbiological studies were aimed at developing techniques for the utilization of wood residues.

There was continued close co-operation with Central Mortgage and Housing Corporation, and numerous tests and investigations were carried out to assess the suitability of industrial wood products for construction purposes. The Laboratory findings determine CMHC acceptance of such materials and are generally on request from CMHC or from the manufacturer. This phase of FPL of C work has the added importance of directly relating product performance to specification requirements, thus providing consumer protection.

¹ See Appendix E, No. 10.

A limited number of tests and investigations were carried out on specific requests from industry, whenever it was considered that data thus secured would be of general application. Work for government departments was also continued during the year and included the determination of the properties of new products, and research on engineering, bending, gluing, wood preservation and decay, and container design problems.

The effectiveness of research is largely dependent upon industrial acceptance and application of its findings. These ends can only be achieved through widespread dissemination of research results. Many FPL of C publications were prepared to report various phases and findings of research. In addition, a large number of articles were written for scientific and trade journals. Members of the staff of both Laboratories gave papers and talks at numerous meetings of professional societies and trade associations. Courses in kiln-drying of lumber were given at Amherst, N.S., and at Ottawa.

Mostly in answer to requests, some 29,000 copies of publications were distributed. Those issued during the year are listed in Appendix G.

A total of 2,740 technical inquiries were answered during the year. These covered a wide range and came from industry and the general public. Some 5,000 wood specimens of Canadian timber species were sold.

Special exhibits were prepared to illustrate the work of the FPL of C and were displayed in Toronto, Montreal, Rouyn, and Ottawa. Requests for similar exhibits are increasing because of the heightened interest shown by industry, trade associations, and the general public. A special exhibit on the forestry and forest products work of the Federal Government was prepared for display in the National Museum during November and December.

There was continued co-operation with the Canadian Exhibition Commission in completing the forestry section exhibit of the Canada Building at the Brussels World Fair, 1958.

Participation as chairmen or members on numerous committees continued to be an important aspect of staff duties. This work was related to the National Building Code, the Canadian Standards Association, the Canadian Government Specifications Board, the American Association for Testing Materials, the Food and Agriculture Organization of the United Nations, as well as technical committees on lumber, plywood, furniture, wood preservatives, and pulp and paper.

To assess more closely the research work carried out, in relation to immediate and future industrial needs, the Advisory Committee at each Laboratory reviewed and discussed the research program with Laboratory personnel. These and other Laboratory committees, widely representative of industry, provide the liaison deemed essential to the effective planning of research. Close co-operation with industry has been particularly notable in the development of programs for increased utilization of sawmill residues, and in the preparation of national standards for Canadian timber products.

Likewise, liaison on a world-wide basis is maintained with government and private wood products research institutions to provide for an exchange

of information and data and to prevent unnecessary duplication of research. Awareness of progress, on an international basis, continued to be important and quite valuable in the orientation of industry, particularly in Canada, which annually must export a large part of the production of its forest-based industries.

There has been recorded an increasing interest from many countries in Canadian forest products research. This was apparent at international meetings, through correspondence, and by a growing demand for FPL of C information. During the year a number of publications have been reprinted in other lands.

The Chief of the Division headed the Canadian delegation to the Seventh British Commonwealth Forestry Conference and Forest Products Pre-Conference, which were held in Australia and New Zealand. Before returning to Canada he visited forest products research establishments and forest-based industries in the Philippines and in Japan.

At the close of the year both Laboratories were moving to more spacious and more suitable quarters, specially designed for forest products research and erected by the Department of Public Works. The new buildings, which provide expanded facilities, will no doubt result in higher staff efficiency in carrying out research, which will in turn assure increased contributions to the progress of our forest-based industries.

Finally, there is notable widening and increasing competition to wood products in all home and external markets. Many of these competitive materials serve quite satisfactorily, and for some uses are equally suitable or more so. It is recognized that the Canadian economy continues to be highly dependent on wood products for home consumption and for export, and that every effort must be made to assure that our forest-based industries will continue to prosper and develop. To these ends the FPL of C has continued to follow carefully and assess developments so that the forest products research program can always be oriented to meet immediate industrial needs and prepare the way for anticipated developments.

National Museum of Canada—Natural History Branch

This Branch is concerned with the collection, study, preservation, and display of material illustrating the geology and biology of Canada, which includes minerals, rocks, fossils, plants, and animals.

During the year under review there were eleven field parties in operation, covering areas in nine provinces and in the Yukon and Northwest Territories. These field investigations resulted in large additions to the Museum collections. Other material was added as gifts, exchanges, and purchases. Active research was continued in botany, zoology, and vertebrate palæontology. Results of completed research projects appeared in a number of publications, some in the Museum Bulletin series, others in scientific journals. Plans for the revised exhibition halls were brought to the scale-model stage. Preparation of exhibits for these new halls was begun, mainly in the fields of geology, palæontology, and mammalogy. Two elaborate temporary exhibitions, alternating with those of the Human History Branch, were displayed in the main hall, the first consisting of new or spectacular fossil specimens; the second, prepared in collaboration with the Forestry Branch, demonstrating forest conservation and timber utilization. A four-day seminar on museum methods for curators of national park museums was made available to other museum workers in Canada.

Botany

Four botanical expeditions were in the field during 1957. One was engaged in a study of floras of Nova Scotia, New Brunswick, and eastern Quebec. Another began a survey of the very difficult terrain of the Hudson Bay Lowland. The flora of the Rocky Mountain region of Alberta was studied, and the cryptogamic botany of parts of Yukon Territory was investigated. These expeditions resulted in the acquisition of large collections of plants, parts of which were deposited in the National Herbarium. The remainder were made available for distribution as exchange with other herbaria. Copious field notes were made, as well as numerous photographs, mostly in colour.

Work in the Museum consisted mainly of the identification of the collections made during the field investigations, and the compilation of reports on these. Many plants were also identified for other Branches of the Government Service, as well as for museums, universities, and private individuals. Principal botanical reports now in preparation are on the flora of the Atlantic provinces, of the Hudson Bay lowland, and of the Rocky Mountains. Comprehensive studies were published in the Museum Bulletin series on the flora of Manitoba and of the Arctic Archipelago. Shorter contributions to botany also appeared, as listed in Appendix G. Lectures on botanical subjects were given during the period. Some time was given to preliminary organization of field excursions for the International Botanical Congress of 1959.

Editorial service was provided on a number of manuscripts by authors outside the museum staff. The Chief Botanist, under a Guggenheim grant, conducted studies in European herbaria on the plants of northern Europe and Asia, for comparison with those of northern Canada.

Field work resulted in the addition of 17,952 specimens to the National Herbarium, and 5,510 specimens were received by exchange and 3,489 by donation. For purposes of study, 2,132 specimens were sent on loan to other botanical institutions, and 277 were borrowed by the Museum. Distribution of duplicate specimens to other herbaria in exchange totalled 10,010. Mounted specimens of vascular plants to the number of 3,975, and cryptogamic specimens numbering 5,044, were prepared and inserted, bringing the total number of specimens in the National Herbarium to 325,059. The collection of indexed type specimens was increased to 1,761 by the addition of 24. Canadian and foreign botanists using the National Herbarium collection during the year totalled 150.

Zoology

During the year seven field parties investigated various portions of the Canadian fauna. The mammals of Newfoundland, New Brunswick, and Quebec; the birds of New Brunswick, Ontario, and Alberta; the reptiles and amphibians of Alberta; the marine invertebrates of Queen Charlotte Islands, B.C.; and the fauna of Adelaide Peninsula, N.W.T., were studied, and specimens were collected.

Studies are in progress on the caribou and other northern mammals, on the herpetology of Eastern Canada, on terrestrial amphipods, on the amphipod genus *Gammarus*, and on the zoology of the Adelaide Peninsula. The text of a comprehensive work on the birds of Canada is in preparation, and a start has been made on a similar project on the mammals of Canada. A preliminary paper has been completed on the caribou study, and a final report on the mammals of Banff National Park. In addition to the monographic work on birds, studies have been completed on the birds of Cape Breton Island, and on the plumage and moults of loons. By request, special studies have been made on certain birds of Alberta and of northern Quebec. Studies were completed on the garter snakes of Eastern Canada and on the post-glacial dispersal of amphibians and reptiles, with particular reference to the painted turtle. Papers on the fresh-water amphipods of glaciated North America, on certain marine amphipods from the Pacific Coast, and on the ecology of shore invertebrates on the Pacific Coast, were prepared for publication. On request, editorial work on zoological manuscripts was performed by staff members. In collaboration with the National Film Board, new film strips on Canadian reptiles and amphibians and French editions of film strips on mammals were prepared. The Museum was represented at six meetings of zoological organizations. Evidence in court was furnished by one staff member in a case involving possible infraction of the Migratory Birds Convention Act.

Detailed plans were made for future exhibits of mammals and birds. A start was made on the taxidermy for a habitat group on the barren-ground caribou and on the grizzly bear. A special expedition to northern Saskatchewan was necessary to obtain suitable caribou specimens. A total of 347 birds and mammals were lent to schools for teaching purposes and to the Canadian Government Exhibition Commission for use at the Brussels Universal and International Exposition. Experiments were conducted on the plastic embedding of specimens for loan purposes.

Curatorial work on the zoological collections was continued, with new material being integrated as quickly as possible. To speed up documentation, temporary assistance was obtained under contract. Additions to the accessioned collections during the period were as follows: 1,001 mammals, 1,734 birds, 1,839 reptiles and amphibians, 6,000 fishes, and 29,000 invertebrates. Most notable single accession was the residue of the osteological collection of the Wistar Institute of Philadelphia, a very valuable addition to reference material. At the end of the fiscal year, the approximate numbers of specimens in the research collections were as follows: 24,000 mammals, 42,900 birds, 12,000 reptiles and amphibians, 8,000 fishes, 177,800 invertebrates.

Palæontology

Field work in palæontology was mainly confined to the collection of Cretaceous dinosaurs and other fossil vertebrates from Scabby Butte, near Nobleford, Alta. Some preliminary examination was made of areas around Foremost and Comrey. A possible locality for Eocene mammals at Princeton, B.C., was revisited with members of the Geological Survey of Canada. A staff member participated in the opening ceremonies of the "Dinosaur Trail" at Drumheller, Alta., and subsequently a party from the Canadian Museums Association was conducted through the nearby fossil field.

Research under way includes studies on the following subjects: the Permian reptiles of New Mexico, the Cretaceous dinosaurs of Alberta, the Tertiary crocodilians of South America, and the Tertiary mammals of Saskatchewan. Papers were completed on a giant example of the extinct reptile *Champsosaurus*, on a duckbilled dinosaur footprint and a horned dinosaur skull from Alberta, and on a Pliocene horse bone from Alberta. Routine identification and cataloguing of the collection was continued; this included both current accessions and the large back-log of earlier acquisitions. In the laboratory the difficult task of preparing the skeleton of a flesh-eating dinosaur for exhibition was completed. The specimens from Scabby Butte were nearly all made ready for study. Dinosaur exhibits in the Museum were repaired and renovated, new labels being provided in some cases. Much time was spent installing, supervising, and later removing a temporary exhibition of fossil vertebrates entitled "Old Bones". A detailed plan, with scale model, was prepared for the proposed new hall of palæontology. Numerous specimens were examined and reported on for persons in various parts of Canada and abroad.

By collection, exchange, and donation, approximately 400 specimens were added during the year to the collection of vertebrate fossils. This collection now consists of approximately 4,700 catalogued specimens, with many others still in the original field wrappings.

National Museum of Canada—Human History Branch

The present fiscal year marks the beginning of a reorganization of the former anthropological section of the National Museum. Owing to the imminent departure of the National Gallery and the Geological Survey to new quarters, ample space will be available for additional displays and the remodelling of old ones according to modern techniques.

In order to meet the scientific and educational needs of a modern museum, a start was made in filling certain gaps in the organization. A section of folklore is being established on a permanent basis with the appointment of qualified personnel. Organization of other sections, whose energies will be concerned chiefly with the cataloguing and maintenance of collections and the study of future exhibits, was started.

The Museum collections were increased by material brought back from the field by officers of the Branch, as well as by numerous gifts from individuals and institutions and by purchase.

The work of the Museum is divided into two different fields: education and research. The latter will be described under the headings of Archæology, Ethnology, and Anthropology (Folklore), as well as in the bibliography of the papers published during the year by the scientific personnel.¹

*Educational Services*²

These services included the following:

(a) *Dealing with requests for information* coming from all parts of the world, required by school teachers, school children, and other citizens; tourists visiting the country interested in Amerindian and Canadian civilization, university students, and research workers.

(b) *Guiding tours in the Museum.* These tours are a joint service operating for the Natural History and Human History Branches. Details of this activity are included in the report of the Natural History Branch.

(c) *Setting up the following temporary exhibits:* The Canadian Eskimos; Irish Yesterday, or the Folklore of Ireland; and West Coast Art Exhibition. There was an attendance of approximately 57,000 at these three exhibits.

The Branch also participated in twenty-six other exhibitions, as well as in three travelling exhibits of Eskimo carvings in Europe, South America, and Greenland. Many specimens were also loaned for the Canadian Pavilion at the Brussels Exhibition. During the year, a small display of Indian and Eskimo craft was shown in the Parliament Buildings when the Postal Union Conference was in session.

¹ See Appendix G.

² See Education in Appendix F.

(d) *Lectures¹ and folkloric concerts.* Special lectures and folkloric concerts were held in conjunction with the temporary exhibits.

(e) *Other educational activities.* A filmstrip accompanied by a commentary on argillite carvings was prepared in co-operation with the National Film Board and will be ready for circulation during the coming year.

Archæology

A joint archæological program with the Department of Anthropology of the University of Toronto was continued in the St. Lawrence Seaway at Sheek Island. Here, besides giving students valuable training, archæological material, more than 2,000 years old, was removed before the flooding of the area for the Seaway.

In the Ungava Peninsula, archæological surveys and excavations were undertaken in the area of Payne Bay, Payne Lake, and Sugluk Inlet.

All the sites investigated were of the enigmatic Dorset culture. Analysis has revealed a sequence within this cultural tradition. The discovery of the first Dorset skeleton, which shed new light on the racial affinities of this group, was of particular interest.

Archæological surveys and very minor excavations were undertaken in southwest Yukon. Ninety-six sites were discovered, and analysis of 1,170 artifacts from these sites has revealed a sequence of cultures extending back perhaps 8,000 years. The second to fourth culture, represented by thirty-two sites is closely connected with materials found in northeastern Siberia and Outer Mongolia.

A small mound was excavated near Courtenay, B.C. This interesting structure contained artifact material found to be about 4,000 years old—the first remains of this time period to be found in British Columbia.

Survey work was continued in Northern Ontario, with emphasis on the examination of reported and unexplained features, such as pits and cairns. Work in a cave on Manitoulin Island was started. Further studies of several historic features in the vicinity of Hawkesbury were made.

During the winter and spring months, analysis of a variety of archæological problems was undertaken, and a typological study was made of a collection from Combe-Capelle by Dr. Henry Ami, in the course of directing the Canadian School of Prehistory. The collection has been divided between the National Museum of Canada and other museums in Canada. Over a dozen manuscripts were submitted for publication. In addition, plans for twenty-two exhibits were also prepared and submitted to the artists and museologists. Archæological materials from Quebec, Ontario, Manitoba, British Columbia, the Yukon, and the Northwest Territories were received, processed, and catalogued.

¹ See Appendix F, lecture list.

Ethnology

Field work was done at Gascons and the adjacent region to study the evolution of the village. This particular area was chosen for intensive study of socio-cultural change, based on a recently published monograph. This year, special emphasis was on the behaviour patterns, political and otherwise, of the inhabitants. In this project, comparison of field work techniques in North America by a Hungarian scholar, Mrs. Maria de Kretz, was made, with special attention to technological change.

In New Brunswick, the progress of a study on history and linguistics, started by a small local society several years ago, was investigated.

A study of the village of Cheticamp was made in collaboration with Gaston Dulong, dialectologist of Laval University and Harold Scholler of the University of Marburg in Germany. While there, the genealogy of a very large family was also studied.

A summer survey of inter-cultural relations was carried on at Great Whale River, P.Q. Three ethnic groups were investigated: the Eskimos, the Cree Indians, the Euro-Canadians. The decline of fur trapping and hunting, the employment conditions of the natives, and the impact of the activities of various governments and other agencies on native life were analysed. Some folklore and linguistic material was collected.

The officers of the section participated in the organization of the meetings at Quebec of the French Canadian Association for the Advancement of Science and of the Congress of Sociology on Religion.

At the First International Congress of Cultural Collaboration, the Chief Ethnologist was appointed member of the International Committee on Advanced Studies.

Anthropology

(Folklore)

The routine work of this section has greatly increased during the past year because of the growing interest in folklore. In order to improve the material conditions of the Section and increase its efficiency, a reorganization was effected.

A new classification system made possible the cataloguing of thousands of traditional songs in the collections. Owing to insufficient staff, the work could not be carried out fast enough to keep up with the needs.

An important piece of work begun in January 1958 was the tape recording of 2,759 old wax cylindrical records containing 7,120 pieces. By this change it is hoped to improve the reproduction and to preserve the material. Wax cylinders tend to deteriorate at each hearing and become completely ineffective after short usage. In this undertaking, Luc Lacourcière and Roger Matton of the Folklore Archives of Laval University collaborated. So far, 1,521 pieces have been transcribed.

The folklore section added to its wealth the musical notation of 600 songs from Dr. Helen Creighton's collection. Work is continuing and will

soon cover about 4,000 pieces. The transcription is being made by Kenneth Peacock, through funds obtained by Miss Creighton from the Canadian Arts Council for the purpose. In addition to this work, Miss Creighton's phonograph records were retranscribed and improved by specialists, and copies of 170 reels were donated to the Museum.

Another important undertaking was the tape recording of Dr. Marius Barbeau's memoirs, which include, in particular, the historical account of the Anthropological Division of the Museum from 1911 to the present, and comments on his own bibliography. This work, still in progress, will constitute an inventory of specimens and manuscripts that Dr. Barbeau has studied in small regional museums or in privately owned collections.

Among the other valuable additions made to the Museum collections were 35 reels of songs offered by the National Film Board. These songs, recorded under the best technical conditions, include 445 pieces collected from the Acadians in the Ottawa district, the Island of Orleans, Charlevoix County, Gaspé Peninsula, and Nova Scotia; from Ukrainians in Winnipeg; and from among the Tsimshians of Fort Simpson and the Haidas of the Queen Charlotte Islands.

The Museum has received the gift of 281 pieces recorded on 16 reels by Rev. Father Anselme, Capuchin friar, at Cape Breton Island in 1957.

Ethno-folkloric research work was begun on the North Shore of the St. Lawrence River as far as Labrador, primarily to prepare a list of possible future investigations in these areas. The results proved to be most satisfying. Important data were gathered on oral literature and popular traditions, revealing the survival on these coasts of cultural characteristics that are vanishing from other parts of the Province. An intensive study was made of the beliefs, recipes, popular medicine, and explanations of place names, upon which monographs will be based. The most extensive investigations dealt with fishing, its terminology and technology.

Research was continued in the Gaspé Peninsula to compare certain social and human characteristics observed on the North Coast, as well as some customs maintained or modified by Gaspesians from the North Coast in the last century. During this expedition, 29 reels were made, including tales, songs, and interviews, and some interesting material on the origins of the North Coast population in pastoral letters at the Lourdes-du-Blanc-Sablon Archives. The letters were helpful in explaining certain behaviour patterns that investigations had so far been unable to explain.

Valuable information was also brought back from the North Coast on archaeological sites worth excavating, at Bradore, River St. Paul, St. Augustin, and La Tabatière where lithic specimens and some bones were found.

In Nova Scotia, folklore investigations were carried out at Pubnico, and in the Windsor and Wolfville areas, chiefly at Sambro; and at Musquodoboit and various places on Cape Breton Island, where a valuable collection of songs was made. These were mostly in English with a few in French and Gaelic. The expedition ended at Shediac, N. B.

Dr. Helen Creighton recorded important information on various folklore collections deposited at institutions in New Brunswick and Nova Scotia. While there, Dr. Creighton gave three lectures on the value of research and on the responsibility of the National Museum of Canada in taking care of collections.

In co-operation with the National Film Board, a film was made showing the value of the work done by the folklorist and the role of the informant during the recordings. A young singer, discovered during an investigation, was given a chance to show her talent.

In Saskatchewan, particularly in the areas of Fort Qu'Appelle, Batoche, Saskatoon, and Prince Albert, studies were chiefly on the Metis. These ethno-folkloric investigations, though covering all aspects of ethnology, were concentrated primarily on musicology and history.

Good results were obtained from an intensive study of the dances and songs of the Crees (the Piapots) and the Sioux. The religious beliefs and tales preserved by the Doukhobors also provided an interesting study. Thirty-nine reel recordings were obtained from this project. This investigation in Saskatchewan provided the opportunity of holding a meeting of the Canadian Society of Traditional Music (whose headquarters are at the National Museum in Ottawa). Another meeting was also held to organize a "Saskatchewan Folklore Committee" to continue the work of the investigators.

Other studies included ones on the gastronomy in rural areas around Montreal, on the popular names of Quebec plants, and on ethno-botanical aspects of old manuscripts from the beginning of the 18th century in New France.

Canadian Government Travel Bureau

The Canadian Government Travel Bureau is the federal agency established to promote travel to and within Canada, and to further the general interests of the Canadian tourist industry. Most of its staff of approximately 90 persons occupy parts of the first and second floors in the Kent Building, a modern office building in downtown Ottawa, and branch information offices are operated at ground-floor locations in New York City and Chicago. The Bureau also has a travel representative at the Canadian Consulate-General in Los Angeles.

In 1957 tourists from other countries spent a record \$362 million in Canada. This was an increase of \$25 million over 1956, the previous high year. Travel receipts from the United States rose to \$328 million, a gain of \$19 million, while receipts from other countries increased \$6 million to \$34 million. Canadians at the same time spent \$523 million on travel in other countries. There were 28,619,423 individual entries into Canada, including commuter traffic and repeat visitors, and 2,555,074 long-stay automobile entries. Visitors to the National Parks of Canada during the year numbered well over 4 million.

The Twelfth Federal-Provincial Tourist Conference was held at Ottawa on October 21 and 22. Delegates from federal departments, provincial tourist organizations, and the transportation companies attended, and discussions ranged over all aspects of tourist activity in Canada during the year, including problems of increased competition and the high premium on the Canadian dollar during the peak tourist months. Most provinces noted a marked increase in interprovincial travel, an indication of the success of the "Know Canada Better" program.

It was announced at the Conference that owing to increased costs of advertising space and production, the Travel Bureau's advertising budget would be increased by approximately \$82,000 for 1958. The Conference was also informed that the Travel Bureau's Chicago Office would move early in 1958 to a new and better location in ground-floor premises at South Clark and Monroe Streets in downtown Chicago.

The Bureau spent approximately \$1,278,000 on travel advertising in the United States during the year with some \$678,000 used for a general magazine campaign, \$300,000 for a general newspaper campaign, and \$300,000 for a special Atlantic provinces advertising program. The 1957 general campaign ran in 42 different magazines with a total circulation of 154,000,000, and in 73 different daily newspapers with a total circulation of 28,400,000. Advertising for the Atlantic provinces was placed in 6 magazines with a combined circulation of 15,500,000, and in 45 newspapers with a total circulation of slightly more than 20 million.

Travel Counselling

As a result of this extensive advertising campaign, the Bureau serviced a record 645,153 requests for Canadian travel information. Of this total, approximately 561,400 were serviced from Ottawa; 55,742 by the New York Office, 14,369 by the Chicago Office, and 12,146 by the representative in Los Angeles.

Of the 561,400 inquiries serviced from Ottawa, 244,000 were requests for detailed information on travel in Canada, which required special attention by the Travel Counselling Section. More than 15,500 inquiries were given personally dictated replies by the Bureau's travel counselling officers, an indication that more and more prospective visitors are demanding this type of detailed information service to help them plan their vacations in Canada.

Publications

A total of 3,071,000 copies of the main Bureau publications were produced in 1957 with the large runs for such principal items as *Canada—Vacations Unlimited*, both booklet and folder; *Canada—United States Highway Map* and *How to Enter Canada*. All existing service booklets were brought up-to-date by the Travel Counselling Section, and some additional ones were planned for the coming year.

Wide distribution of a leaflet and poster suggesting exchange of American dollars at Canadian banks was made through border crossing points, Canadian transportation companies, and provincial tourist bureaus.

A large percentage of the Bureau's literature and maps was distributed through outlets such as automobile clubs, travel agencies, transportation companies, personnel departments of industrial organizations, and chambers of commerce in the United States and Canada, and in some foreign countries. Promotional mailings of literature encouraging such distribution were carried out early in the year to well over 5,000 contacts.

Publicity

Publicity programs in the United States, in Canada, and in overseas countries included the regular mailings of release material to more than 1,800 media. In addition, the Bureau mailed 8,864 glossy prints in black and white and loaned 1,430 colour transparencies to magazines and rotogravure sections. There are few unsolicited mailings of photo material, and about 90 per cent of the photos are distributed as the result of direct requests. Publicity mailings during the year were expanded, and 297 special travel sections in major United States newspapers were given regional stories and pictures.

Besides making direct placements of Canadian travel publicity, the Bureau worked with many editors in the United States and overseas countries in developing their own Canadian travel stories.

During June and July, 1957, National Film Board photographers carried out picture-taking assignments for the Travel Bureau in Eastern and Western Canada, providing new still photos in black and white and in colour for advertising, publicity, and publications use. Each photographer was accompanied by a member of the Travel Bureau's travel counselling staff. Earlier in the year a two-week photographic schedule in the Laurentians resulted in an excellent new stock of colour and black and white subjects. A number of useful supplementary photographs were purchased from private sources.

Through the operations of the Canadian Travel Film Program in 1957, colour motion pictures of Canada have been shown to a greater number of residents of the United States than in any previous year.

In increasing measure, people in the United States are receiving their impressions over the television screen, and Canadian Travel Films were telecast on 1,826 separate occasions—an increase of 19 per cent over 1956. The spread of colour television facilities has been of special value to Canadian Travel Films. Films of the out-of-doors, portraying the wonders of nature, are much more effective in their natural colours than in black and white. The 232 coloured telecasts provided a marked increase over the 140 shown in the previous year.

From Film Libraries and circuits some 5,800 prints of 161 titles were in circulation. This material, made available without charge to groups, resulted in 83,896 showings to audiences totalling 5,075,244. The pattern of outlets and circuits was again extended, resulting in 450 individual sources across the 48 States, from which these colourful films may be obtained.

APPENDICES

Appendix A

Summary of Revenues and Expenditures, 1957-58

	<i>Revenues</i>	<i>Expenditures</i>
ADMINISTRATION SERVICES.	\$ 356 65	\$ 672,238 26
Contributions to the Provinces for Camp-ground and Picnic Area Developments.....		491,650 51
NORTHERN RESEARCH CO-ORDINATION CENTRE.....		78,665 90
NATIONAL PARKS BRANCH		
Branch Administration.....	—	129,680 45
National Parks and Historic Sites.....	1,496,885 37	16,934,471 74
Grant to Jack Miner Migratory Bird Foundation.	—	5,000 00
Grant in aid of the development of the Inter- national Peace Garden in Manitoba.....	—	9,891 11
National Battlefields Commission.....	—	183,878 88
Canadian Wildlife Service.....	1,774 27	571,008 70
	1,498,659 64	17,833,930 88
WATER RESOURCES BRANCH.....	134,551 25	1,851,330 21
NORTHERN ADMINISTRATION AND LANDS BRANCH		
Branch Administration.....	309,714 96	1,115,812 49
Yukon Territory.....	322,324 61	1,705,888 05
Northwest Territories.....	1,420,222 97	15,756,928 73
	2,052,262 54	18,578,629 27
FORESTRY BRANCH		
Branch Administration.....	—	167,602 89
Forest Research Division.....	25,858 67	1,377,848 04
Forestry Operations Division.....	35,788 28	3,362,597 85
Forest Products Laboratories Division.....	3,481 11	2,289,185 35
Grant to Canadian Forestry Association.....	—	10,000 00
Eastern Rockies Forest Conservation Board.....	—	4,944 67
	65,128 06	7,212,178 80
NATIONAL MUSEUM OF CANADA.....	1,916 20	421,883 36
CANADIAN GOVERNMENT TRAVEL BUREAU.....	79 34	1,930,766 03
TOTALS FOR DEPARTMENT.....	\$ 3,752,953 68	\$49,071,273 22

Appendix B

1. Mineral Production

		1956		1957 ¹	
		Quantity	Value	Quantity	Value
NORTHWEST TERRITORIES					
		\$		\$	
Gold.....	352,669 oz.	12,149,447	338,721 oz.	11,360,702	
Silver.....	69,916 oz.	62,701	66,165 oz.	57,782	
Copper.....	—	—	285,858 lb.	82,699	
Nickel.....	—	—	1,147,540 lb.	797,540 ²	
Pitchblende.....	873,912 lb.	9,176,076	850,000 lb.	8,925,000 ²	
Crude Petroleum.....	449,409 bbl.	762,773	428,000 bbl.	736,160	
Natural Gas.....	21,210 M cu.ft.	6,938	18,500 M cu.ft.	6,050	
TOTAL....		22,157,935		21,965,933	
YUKON TERRITORY					
		\$		\$	
Gold.....	72,001 oz.	2,480,434	69,954 oz.	2,346,257	
Silver.....	6,192,706 oz.	5,553,619	6,313,278 oz.	5,513,386	
Lead.....	25,604,220 lb.	3,971,215	25,095,537 lb.	3,503,337	
Coal.....	9,372 tons	111,104	8,131 tons	96,299	
Zinc.....	21,052,518 lb.	3,124,194	17,475,430 lb.	2,112,779	
Cadmium.....	244,628 lb.	415,868	164,165 lb.	279,080	
TOTAL....		15,656,434		13,851,138	

¹ Preliminary figures.² Figures for 1932 and 1942 to 1953 inclusive not available.

2. Oil and Gas Permits, Leases, and Reservations

YUKON AND NORTHWEST TERRITORIES

	Number	Acreage
<i>Northwest Territories—</i>		
Active Oil and Gas Permits.....	403	21,439,160
Applications for Oil and Gas Permits.....	325	13,757,645
Oil and Gas Leases.....	6	3,270
Surface Leases.....	2	892.2
<i>Yukon—</i>		
Active Oil and Gas Permits.....	225	10,006,955
Applications for Oil and Gas Permits.....	106	4,988,645
Oil and Gas Reservations (N.W.T. and Yukon).....	2	6,133,760

PROVINCIAL OIL AND GAS LEASES

Manitoba.....	78	12,480
Saskatchewan.....	138	22,080
Alberta.....	147	23,520
TOTAL.....	363	58,080

3. Land, Grazing, Hay, and Quarrying Privileges

	Yukon	Northwest Territories
LAND SALES—		
Sales completed.....	29	10
New agreements of sale.....	15 (a)	14
Agreements of sale in force.....	132 (b)	69 (c)
(a) Includes 7 agreements for veterans.		
(b) Includes 113 agreements for veterans.		
(c) Includes 40 agreements for veterans.		
LAND PRIVILEGES—		
New leases executed.....	31	23
Leases renewed.....	17	14
Cancellations.....	19	22
Assignments registered.....	6	4
<i>Leases in force:</i>		
Agricultural.....	7	9
Fur farm.....	1	4
Grazing.....	7 (a)	3 (b)
Quarrying.....	1	2
Residential and commercial.....	142 (c)	141 (d)
Waterfront.....	19	49
Licences of occupation.....	3	7
Permissions to occupy.....	7	13
TOTAL LEASES IN FORCE.....	187	228
(a) 78 horses and 5 head of cattle maintained.		
(b) 7 horses and 6 head of cattle maintained.		
(c) Includes 2 leases for veterans.		
(d) Includes 11 leases for veterans.		
HAY PERMITS—		
Permits issued.....	2 (a)	—
(a) Authorized cut—12 tons.		

4. Timber Permits Issued and Volume of Timber Cut,
Yukon and Northwest Territories

Type of Permit	Yukon Territories				Northwest Territories ¹			
	Permits Issued	Lumber (ft.b.m.)	Round Timber (lin. ft.)	Fuel-wood (cords)	Permits Issued	Lumber (ft.b.m.)	Round Timber (lin. ft.)	Fuel-wood (cords)
Commercial permits.....	21	3,004,405	1,314,770	540	16	12,535,925	233,276	—
Other permits—								
Free of fees and dues.....	11	—	7,400	334	8	—	60,800	40
Free of dues.....	14	—	5,200	1,165	21	—	15,000	2,798
Dues paid.....	173	170,000	86,608	3,505	100	40,000	140,359	2,434
TOTALS...	219	3,174,405	1,413,978	5,544	145	12,575,925	449,435	5,272

¹ Includes Wood Buffalo Park.

5. School Classification, Location and Attendance

Settlements and Types of Schools	Number of Teachers	Status and Number of Pupils Enrolled as of March, 1958			
		White	Indian	Eskimo	Total
DISTRICT OF MACKENZIE—					
Aklavik—Federal.....	7	83	41	54	178
Aklavik—Anglican Residential.....	5	2	46	64	112
Aklavik—R.C. Residential.....	7	34	56	83	173
Aklavik—R.C. Hospital.....	1	—	9	8	17
Inuvik—Federal.....	3	18	5	16	39
Aklavik—Anglican Hospital.....	1	1	8	19	28
Arctic Red River—Federal.....	1	1	10	—	11
Bathurst Inlet—R.C. Mission Part- time.....	1	—	—	12	12
Coppermine—Federal.....	3	—	—	44	44
Jean Marie River—Federal.....	1	—	21	—	21
Fort Franklin—Federal.....	2	2	39	—	41
Fort Good Hope—Federal.....	1	11	34	—	45
Fort Liard—Federal.....	1	3	16	—	19
Fort McPherson—Federal.....	3	19	69	—	88
Fort Norman—Federal.....	2	30	18	—	48
Fort Providence—R.C. Residential.....	4	10	91	—	101
Fort Resolution—Federal.....	4	62	32	—	94
Fort Resolution—R.C. Hospital.....	1	5	5	—	10
Fort Simpson—Federal.....	4	40	25	—	65
Fort Simpson—R.C. Hospital.....	1	2	8	—	10
Hay River—Federal.....	10	174	27	—	201
Fort Smith—Federal.....	21	301	153	—	454
Fort Smith—R.C. Hospital.....	1	6	26	5	37
Fort Rae—Federal.....	2	10	44	—	54
Fort Rae—R.C. Hospital.....	1	—	14	—	14
Reindeer Station—Federal.....	1	1	1	18	20
Rocher River—Federal.....	1	8	8	—	16
Tuktoyaktuk—Federal.....	3	5	—	52	57
Yellowknife—Public.....	15	302	—	—	302
Yellowknife—R.C. Separate.....	6	126	15	—	141
Discovery—Yellowknife Mine.....	1	14	—	—	14
Norman Wells—Imperial Oil.....	1	7	—	—	7
Port Radium Mine.....	1	6	—	—	6
Rayrock Mine.....	1	7	—	—	7
DISTRICT OF KEEWATIN—					
Baker Lake—Federal.....	1	2	—	54	56
Chesterfield Inlet—Federal.....	4	14	—	92	106
Coral Harbour—Federal.....	1	1	—	34	35
Eskimo Point—Anglican Mission— Part-time.....	1	—	—	22	22
Eskimo Point—R.C. Part-time....	1	—	—	32	32
Pelly Bay—R.C. Part-time.....	1	—	—	35	35
Rankin Inlet—Company.....	1	1	—	60	61
DISTRICT OF FRANKLIN—					
Cambridge Bay—Federal.....	2	—	—	44	44
Gjoa Haven—R.C. Mission Part- time.....	1	—	—	18	18
Spence Bay—R.C. Mission Part- time.....	1	—	—	13	13
Spence Bay—Anglican Mission Part- time.....	2	—	—	27	27
Igloodik—R.C. Mission Part-time...	1	—	—	27	27
Repulse Bay—R.C. Mission Part- time.....	1	—	—	22	22
Cape Dorset—Federal.....	1	3	—	24	27
Lake Harbour—Anglican Mission— Part-time.....	1	—	—	14	14
Frobisher Bay—Federal.....	4	6	—	109	115
Pangnirtung—Federal.....	1	1	—	14	15
Pond Inlet—Anglican Mission—Part- time.....	1	—	—	42	42
Pond Inlet—R.C. Mission—Part- time.....	1	—	—	6	6
Resolute Bay—Eskimo—Part-time....	1	—	—	15	15

5. School Classification, Location and Attendance (Cont'd)

Settlements and Types of Schools	Number of Teachers	Status and Number of Pupils Enrolled as of March, 1958			
		White	Indian	Eskimo	Total
NORTHERN QUEBEC—					
Port Chimo—Federal.....	1	4	—	15	19
Koartak—R.C. Mission—Part-time.	1	—	—	16	16
Wakeham Bay—R.C. Mission— Part-time.....	1	—	—	13	13
Sugluk—Federal.....	1	—	—	43	43
Ivuyivik—R.C. Mission—Part-time.	1	—	—	21	21
Povungnituk—R.C. Mission—Part- time.....	1	—	—	73	73
Port Harrison—Federal.....	1	—	—	14	14
Great Whale River—Federal.....	2	3	14	51	68
Fort George—Anglican Residential..	1	—	—	7	7

6. Revenue

—	N.W.T.		Yukon		Provinces		Total	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.
Mining.....	226,243	32	96,116	47	—		322,359	79
Oil and Gas.....	822,466	35	92,208	62	267,907	62	1,182,582	59
Lands, Timber and Grazing.....	155,840	59	53,103	94	56,689	64	265,634	17
TOTALS.....	1,204,550	26	241,429	03	324,597	26	1,770,576	55

7. Seed Grain, Fodder, and Relief Advances—Financial Operations

—	Principal		Interest		Total	
	\$	cts.	\$	cts.	\$	cts.
DEBITS—						
<i>Amount outstanding March 31, 1957—</i>						
Alberta.....	110,519	97	203,916	69	314,436	66
Saskatchewan.....	337,991	03	681,279	29	1,019,270	32
<i>Accrued interest April 1, 1957 to March 31, 1958—</i>						
Alberta.....	—		7,077	48	7,077	48
Saskatchewan.....	—		10,388	25	10,388	25
TOTAL DEBITS.....	448,511	00	902,661	71	1,351,172	71
CREDITS—						
<i>Net Revenue April 1, 1957 to March 31, 1958—</i>						
Alberta.....	4,720	04	1,021	68	5,741	72
Saskatchewan.....	12,736	13	430	33	13,166	46
<i>Amount written off as loss by Order-in-Council April 1, 1957 to March 31, 1958—</i>						
Alberta.....	2,005	40	18,289	72	20,295	12
Saskatchewan.....	144,749	65	322,537	34	467,286	99
TOTAL CREDITS.....	164,211	22	342,279	07	506,490	29
<i>Amount outstanding March 31, 1958—</i>						
Alberta.....	103,794	53	191,682	77	295,477	30
Saskatchewan.....	180,505	25	368,699	87	549,205	12
TOTAL.....	284,299	78	560,382	64	844,682	42

Appendix C

**1. Location, Area and Comparative Statement of Visitors to the National Parks,
April 1, 1957 to March 31, 1958**

	Province	Area	1957-58	1956-57	Increase or Decrease
NATIONAL PARK—					
Banff.....	Alta.	2,564 sq. mi.	790,910	717,799	+ 73,111
Cape Breton Highlands	N.S.	377 "	128,397	116,556	+ 11,841
Elk Island.....	Alta.	75 "	183,041	159,531	+ 23,510
Fundy.....	N.B.	79.5 "	143,662	120,666	+ 22,996
Georgian Bay Islands.	Ont.	5.4 "	26,300	25,175	+ 1,125
Glacier.....	B.C.	521 "	222	562	— 340
Jasper.....	Alta.	4,200 "	332,024	269,704	+ 62,320
Kootenay.....	B.C.	543 "	347,678	330,412	+ 17,266
Mount Revelstoke...	B.C.	100 "	39,028	16,011	+ 23,017
Point Pelee.....	Ont.	6 "	591,235	572,694	+ 18,541
Prince Albert.....	Sask.	1,496 "	123,280	115,591	+ 7,689
Prince Edward Island	P.E.I.	7 "	200,748	181,692	+ 19,056
Riding Mountain.....	Man.	1,148 "	630,189	572,084	+ 58,105
St. Lawrence Islands..	Ont.	172 acres	59,250	49,175	+ 10,075
Waterton Lakes.....	Alta.	203 sq. mi.	302,872	246,466	+ 56,406
Yoho.....	B.C.	507 "	41,875	35,858	+ 6,017
SUB-TOTAL.....		11,832.2 sq. mi	3,940,711	3,529,976	+410,735
NATIONAL HISTORIC PARK—					
Alexander Graham Bell Museum.....	N.S.	—	36,053	*	+ 36,053
Fort Anne.....	N.S.	31 acres	24,052	21,362	+ 2,690
Fort Battleford.....	Sask.	37 "	15,214	12,384	+ 2,830
Fort Beauséjour.....	N.B.	81 "	13,778	23,509	— 9,731
Fort Chambly.....	P.Q.	2.5 acres	72,965	70,580	+ 2,385
Fort Lennox.....	P.Q.	210 "	13,335	11,637	+ 1,698
Fortress of Louisbourg	N.S.	339.5 acres	20,705	18,068	+ 2,637
Fort Malden.....	Ont.	5 "	21,197	20,663	+ 534
Fort Wellington.....	Ont.	8.5 "	17,426	13,243	+ 4,183
Grand Pré.....	N.S.	—	31,362	*	+ 31,362
Halifax Citadel.....	N.S.	37 "	234,000	213,860	+ 20,140
Port Royal Habitation	N.S.	20.5 "	23,441	23,816	— 375
Woodside.....	Ont.	11 "	1,284	1,074	+ 210
SUB-TOTAL.....			524,812	430,196	+ 94,616
ESTIMATED ATTENDANCE 1958—					
Batoche Rectory.....	Sask.	—	800	*	+ 800
Lower Fort Garry....	Man.	13 acres	21,300	*	+ 21,300
Fort Langley.....	B.C.	—	3,500	*	+ 3,500
Fort Prince of Wales..	Man.	50 "	550	*	+ 550
Laurier's Birthplace..	P.Q.	—	4,650	*	+ 4,650
Signal Hill.....	Nfld.	—	500	*	+ 500
SUB-TOTAL.....			31,300	*	+ 31,300
Total, Historic Parks.....			556,112	430,196	+125,916
GRAND TOTAL.....			4,496,823	3,960,172	+536,651

* No attendance records available for 1956-57.

N.B.—No attendance records available for Wood Buffalo Park, Alta.—N.W.T. (17,300 sq. mi.); Terra Nova Park, Nfld. (156 sq. mi.).

2. Maintenance of Roads

National Park	Location	Work
BANFF.....	Trans-Canada Highway:	
	Mile 13.3 - Mile 29.1.....	Bituminous base course completed.
	Mile 29.1 - Mile 43.....	Gravelling completed.
	Mile 43 - Mile 51.....	Gravelling completed. Good progress made on bridge at Mile 43.3 and overpasses at Mile 43.5 and Mile 50.6.
	Banff-Jasper Highway:	
	Mile 2 - Mile 22.....	Bituminous base course completed.
	Mile 22 - Mile 34.....	Gravelling completed.
	Mile 34 - Mile 40.....	Construction and gravelling nearly completed.
	Mile 40 - Mile 46.....	Grading work.
	Mile 46 - Mile 68.....	Survey work completed.
	Banff-Windermere Highway:	
	Mile 0 - Mile 7.....	Clearing work completed.
JASPER.....	Jasper-Banff Highway.....	Bridges at Poboktan Creek and Astoria River completed.
	Miette Hot Springs Road.....	Bridge at Morris Creek replaced.
KOOTENAY.....	Banff-Windermere Highway:	
	Mile 0 - Mile 7.....	Clearing work.
	Mile 7 - Mile 32.....	Clearing completed.
	Mile 32 - Mile 56.4.....	Base course completed; asphalt surfaced.
	Wardle and Haffner Creeks.....	Bridges completed.
YOHO.....	Trans-Canada Highway:	
	Mile 0 - Mile 12.....	Asphalt surfaced.
	Mile 12 - Mile 17.6.....	Base course completed.
	Mile 21 - Mile 28.5.....	Oil base course completed.
	Mile 12.9 and Mile 21.5.....	Bridges completed.
	Mile 16.7, Mile 21.8, and Mile 22.7..	Overpasses completed.
ELK ISLAND.....	West Gate.....	Entrance roadway regraded, gravelled and concrete curbs constructed.
PRINCE ALBERT.....	Waskesiu Highway.....	All signs reset; all curves cleared to improve visibility; area around gatehouse resurfaced.
RIDING MOUNTAIN.....	South Gateway.....	New approach road constructed.
	Lakeshore Drive.....	Metal retaining wall constructed to retard hill erosion.
FUNDY.....	Point Wolfe Road.....	Guard rail erected at approaches to covered bridge.
PRINCE EDWARD ISLAND..	Gulf Shore Road: Dalvay—Covehead Harbour.....	Reconstruction completed with asphalt surfacing and erection of Covehead bridge.

3. Improvements to Trails

National Park	Location	Work
BANFF.....	Spray River.....	Fire trail extended 3.5 miles.
	Cascade River.....	4 miles fire trail reconstructed.
	Johnston's Canyon.....	Foot bridges redecked; rock blasting.
JASPER.....	Willow Creek.....	Fire road extended 4 miles.
	Smoky River.....	13 miles trail brushed out and graded.
	Portal Creek.....	9 miles trail brushed out and graded.
KOOTENAY.....	Verdant, Simpson and Pitts Creek Trails.....	Brush cutting.
	West Kootenay and East Vermilion Fire Trails.....	Widened and ditched.
YOHO.....	Lake O'Hara.....	North and east shore footpath reconstructed; 90-foot bridge constructed.
	Morning Glory Lakes.....	New 1-mile access trail from Linda Lake Trail constructed.
	Lake McArthur.....	New 1½-mile footpath access trail constructed.
	Ottertail Fire Road.....	Extensive ditching, grading and gravelling carried out.
	Kicking Horse Fire Road.....	2 miles reconstructed.
	Porcupine Fire Road.....	2 miles reconstructed; 60-foot bridge erected.
ELK ISLAND.....	Isolation Area.....	New 4-mile access trail constructed.
RIDING MOUNTAIN.....	Central Fire Road.....	Cleared, graded, and gravelled for 9 miles.
FUNDY.....	Laverty Fire Trail.....	3-mile trail constructed.
	Goose River Fire Trail.....	Clearing completed to Mile 5.5; grading completed to Mile 2.5.
	Rat Tail Brook.....	3-mile walking trail constructed.
	Marvin Lake.....	2 miles cleared.
	Bennett Brook.....	1½-mile trail cleared; 31-mile fire trail constructed.

4. Mileage of Park Roads, Trails, and Telephone Lines

National Park	Motor Roads	Secondary Roads	Fire Roads	Trails	Telephone Lines
Banff.....	200.40	—	124.25	729.50	282.00
Cape Breton Highlands.....	53.97	7.51	54.87	25.67	15.34
Elk Island.....	18.00	—	—	24.0	29.5
Fundy.....	19.90	—	36.6	25.7	17.0
Georgian Bay Islands.....	—	—	10.00	18.25	—
Glacier.....	—	—	116.75	—	1.5
Jasper.....	146.50	20.00	99.00	622.75	505.70
Kootenay.....	59.30	—	49.80	182.0	61.8
Mount Revelstoke.....	18.58	.24	47.0	—	8.55
Point Pelee.....	11.50	2.00	2.00	1.50	—
Prince Albert.....	65.70	75.75	—	268.75	161.00
Prince Edward Island.....	15.15	4.85	—	—	—
Riding Mountain.....	75.05	13.56	87.5	8.0	140.5
Waterton Lakes.....	43.80	13.50	29.00	83.00	60.00
Yoho.....	45.0	—	39.0	222.5	71.8
TOTAL.....	772.85	137.41	695.77	2,211.62	1,354.69

5. Major Construction in Parks

National Park	By National Parks Branch	By Private Enterprise
BANFF.....	6-suite staff quarters; warden station in Clearwater district; central garage in Workshop compound; kitchen-dining hall at Camp No. 3, Banff-Jasper Highway; 2 equipment buildings near Lake Louise Camp-ground for V.H.F. Radio system.	(a) <i>Townsite</i> : Mineral Springs Hospital; 12-room public school; extensions to 2 blocks of stores; Luxton Museum; café at Lake Louise. (b) <i>Outside Townsite</i> : cosmic ray station on Sulphur Mountain (National Research Council); extension to Calgary Power plant at Anthracite.
JASPER.....	4-suite staff quarters in town-site; staff quarters building at Miette Hot Springs; 2 warden patrol cabins.	Service station; powerhouse addition; staff quarters at a bungalow camp; 28-unit motor hotel.
KOOTENAY.....	At McKay Creek Industrial Compound — kitchen-dining hall, 35-man bunkhouse and winter equipment and oil storage sheds; garage-workshop building at Marble Canyon at Helmet Creek.	Combination office, living quarters, and laundry building at a lodge.
YHO.....	Duplex staff residence.	C.P.R. residence.
WATERTON LAKES.....	New information bureau; warden's residence at Belly River; kitchen shelter at Coppermine Creek Camp-ground; shower facilities in staff quarters at Registration Office; floating docks on Waterton Lake.	18-unit motel; renovations to 10 chalet rooms; 8-unit motel.
ELK ISLAND.....	Bandshell at Sandy Beach, Warden's residence in isolation area.	
PRINCE ALBERT.....	Addition to bunkhouse; oil storage shed; 5 warden patrol cabins.	5 cottages; stable; 2 bungalow cabins.

5. Major Construction in Parks—(Cont'd)

National Park	By National Parks Branch	By Private Enterprise
RIDING MOUNTAIN.....	Townsite Information Building; garage-workshop and barn at Ochre River Warden Station; registration booth at South Gateway.	Microwave relay tower by Manitoba telephone system near Moon Lake.
POINT PELEE.....	Addition to administration building.	
FUNDY.....	Glass windbreak around swimming pool.	

6. Improvements to Townsites

National Park	Location	Work
BANFF.....	Beaver Street.....	.. Curb and gutter from Buffalo to Wolf Street; street asphalt surfaced.
	Bow Avenue.....	.. Asphalt surfaced from Buffalo to Wolf Street.
	Wolf Street.....	.. Asphalt surfaced from Bow Avenue to Lynx Street.
	Banff Avenue.....	.. Hydrants replaced between Mar-mot and Wolf Streets; gas, power and telephone services placed underground in this area.
JASPER.....	Connaught Street.....	.. Curb and gutter constructed and new street lighting erected opposite block 13.
	Administration Building.....	.. Asphalt walks.
	Miette Avenue.....	.. Concrete curbing on the boulevards opposite block 36.
	Elm Street.....	.. 2 hydrants installed.
KOOTENAY.....	Parking area.....	.. Area reorganized and timber guard rails installed.
	Aquacourt.....	.. Landscaping.
RIDING MOUNTAIN.....	Ta-Wa-Pit Drive.....	.. Asphalt sidewalk on south side from Crocus to Lily Street.
FUNDY.....		.. 300,000-gallon reservoir for new water supply system.

7. Additions to Recreational Facilities

National Park	Location	Work
BANFF.....	Tunnel Mountain Camp-ground.....	3 old kitchen shelters replaced; 80 electrical connections (15 amp.) for trailers.

7. Additions to Recreational Facilities (Cont'd)

National Park	Location	Work
Banff (Cont'd).....	Tunnel Mountain trailer park.....	2 service buildings, a water tank, and individual water, sewer and electrical services for 87 trailers on Block 1; streets and lanes rough graded.
	Cave and Basin.....	Public convenience building 75 per cent complete.
	Mount Norquay.....	New ski jump.
	Lake Minnewanka.....	Boat ramp.
JASPER.....	Miette Hot Springs Camp-ground.	2 additional kitchen shelters.
	Rocky River Camp-ground.....	Additional kitchen shelter.
YOHO.....	Kicking Horse Camp-ground.....	New water supply system; 2 additional kitchen shelters; electric lights installed in all shelters.
	Takakkaw Falls.....	Approach roads and parking area graded and gravelled.
	Chancellor Peak Camp-ground.....	Cistern pump for water supply.
PRINCE ALBERT.....	Waskesiu Camp-grounds.....	112 additional tenting lots; 2 kitchen shelters.
RIDING MOUNTAIN.....	Moon Lake Camp-ground.....	New kitchen shelter.
POINT PELEE.....	Picnic areas.....	4 comfort stations; 5 kitchen shelters, 5 fireplaces.
FUNDY.....	Headquarters Camp-ground.....	Kitchen shelter.
CAPE BRETON HIGHLANDS.	Cheticamp Camp-ground.....	3 kitchen shelters.
	Ingonish Camp-grounds.....	2 kitchen shelters; laundry and toilet building; electrical and water services for trailers.

8. Fire Losses in the National Parks

National Park	Number of Fires		Area Burned (acres)		Cost of Suppression			
	1952-56 Av.	1957	1952-56 Av.	1957	1952-56 Av.	1957	\$	cts.
Banff.....	8.2	4	15.0	6.0	774 02	365 10		
Jasper.....	4.0	10	5.4	2.2	700 71	87 32		
Glacier.....	3.0	3	5.7	35.0	324 38	8,751 78		
Kootenay.....	1.6	0	24.4	—	1,552 27	—		
Yoho.....	4.0	3	179.5	2.5	4,153 31	511 54		
Revelstoke.....	1.2	0	1.4	—	397 71	—		
Waterton Lakes.....	.4	1	—	—	8 74	39 60		
Elk Island.....	.2	0	30.0	—	15 76	—		
Prince Albert.....	1.8	2	3,819.1	1.2	1,833 37	728 02		
Riding Mountain.....	2.4	2	186.5	1,260.0	457 83	1,202 85		
Georgian Bay Islands.....	.4	0	—	—	—	—		
St. Lawrence Islands.....	2.0	1	.8	.4	19 58	6 20		
Point Pelee.....	.2	0	—	—	1 25	—		
Fundy.....	.4	0	9.0	—	506 20	—		
Prince Edward Island.....	.6	1	.1	—	1 20	—		
Cape Breton Highlands.....	1.4	2	.3	8.0	35 03	659 75		
TOTAL.....	31.8	29	4,277.2	1,315.3	10,781 36	12,352 16		

9. Reduction of Mammals

National Park	Mammal	Number Killed	Disposal of Meat and Hides
BANFF.....	Elk	101	Meat and hides donated to Indian Affairs Branch and Banff Indian Days Committee.
ELK ISLAND.....	Elk	284	Meat and hides donated to Indian Affairs Branch.
	Moose	53	
JASPER.....	Elk	37	Meat and hides sold.
POINT PELEE.....	Muskrat	1,600	Hides sold by tender.
WATERTON LAKES.....	Elk	200	Meat and hides donated to Indian Affairs Branch.

10. Statement of Large Mammals in Fenced Enclosures in National Parks

	Buffalo	Elk	Moose	Mule Deer	White-tailed Deer	Total
Banff Park Paddock.....	11	—	—	—	—	11
Elk Island Park Paddock....	1,044	865	162	40	55	2,166
Prince Albert Park Paddock..	13	—	—	—	—	13
Riding Mountain Park Paddock.....	30	20	3	—	37	90
Waterton Lakes Park Paddock.....	23	—	—	—	—	23
TOTAL.....	1,121	885	165	40	92	2,303

11. Comparative Statement of Attendance at National Park Bathing Establishments

National Park	Name of Pool	1957-58	1956-57
Banff.....	Upper Hot Springs.....	173,676	159,370
	¹ Cave and Basin.....	108,224	117,164
Jasper.....	¹ Miette Hot Springs.....	65,814	54,608
	¹ Jasper Townsite Pool.....	23,135	26,141
Kootenay.....	Radium Hot Springs Aquacourt.....	173,530	173,650
Fundy.....	¹ Fundy Park Pool.....	21,373	18,697

¹ Open in summer only.

12. Members of Historic Sites and Monuments Board

The Reverend Antoine d'Eschambault, Genthon, Man. (Chairman).

Professor Fred Landon, London, Ont.

Dr. Walter N. Sage, Vancouver, B.C.

The Honourable Thane A. Campbell, Chief Justice of Prince Edward Island, Charlottetown, P.E.I.

Dr. W. Kaye Lamb, Dominion Archivist, Ottawa, Ont.

12. Members of Historic Sites and Monuments Board—(Cont'd)

Dr. Alfred G. Bailey, Dean of Arts, Fredericton, N.B.

Dr. C. Bruce Fergusson, Halifax, N.S.

Richmond Mayson, Esq., Prince Albert, Sask.

H. J. W. Walker, Esq., Ottawa, Ont.

Edouard Fiset, Esq., Quebec, P.Q.

Jules Bazin, Esq., Montreal, P.Q.

O. L. Vardy, Esq., St. John's, Nfld.

Joel K. Smith, Esq., Edmonton, Alta.

A. J. H. Richardson, Esq., National Historic Sites Division, Ottawa, Ont. (Secretary).

13. Improvements and Repairs to National Historic Parks and Sites

National Historic Site	Nature of Work
Lower Fort Garry, Man.....	Continuation of repairs and renovation.
Fort Prince of Wales, Churchill, Man.....	Continuation restoration of outer walls.
Rectory, Batoche, Sask.....	Renovations to old Rectory building.
Fort Chambly, P.Q.....	Repointing walls and stonework. Fencing along Chambly Basin.
Carillon Barracks, P.Q.....	Installation of auxiliary water system. Replacement of floors.
Fort Wellington, Prescott, Ont.....	Installation of electrical wiring.
Fort Langley, B.C.....	Completion of No. 3 Building and Custodian's quarters. Continuation of restoration of palisades, bastion, etc. Landscaping, parking lot construction.
Sir Wilfrid Laurier's Birthplace, St. Lin, P.Q....	Landscaping improvements.
Signal Hill, Nfld.....	Reconstruction of main entrance road (Public Works Dept.).
Halifax Citadel, N.S.....	Continuation of restoration and repairs.
Fort Anne, Annapolis Royal, N.S.....	Removal of obsolete bandstand.
Martello Tower, Saint John, N.B.....	Construction of parking area.
Woodside, Kitchener, Ont.....	Installation of fence.
Fort Malden, Amherstburg, Ont.....	Repairs to museum building and erection of fence.
Grand Pré, N.S.....	Repairs museum building basement, heating system, electrical service, and water system.
Alexander Graham Bell Museum, Baddeck, N.S.....	Construction of living quarters for Custodian.
Fort Battleford, Sask.....	Improvements to grounds. Materials were purchased for replacement of palisades. Completion of underground electrical lines.
Quebec City, P.Q.....	Continuation of repairs to fortification walls.
Fort Lennox, Île-aux-Noix, P.Q.....	Repointing and repairing walls. Repairs to windows, and painting of interior of officers' quarters. Replacement of fences and marking of corners of Protestant and Roman Catholic cemeteries. Replacement of outdoor fireplaces.

14. Banding of Wild Birds

Species	Number
Banded in 1957—	
Ducks (including Coots).....	54,953
Geese (including Brant).....	9,390
Trumpeter Swans (13) Whistling Swan (1).....	14
Colony nesting water birds.....	29,843
Other Migratory Birds.....	28,677
TOTAL, 1957.....	122,877
Banded to date.....	1,197,374
Banded birds recovered to date.....	106,711
(This total includes birds banded in Canada and recovered in Canada or elsewhere; also records of birds banded elsewhere than in Canada and recovered in this country.)	

15. Licences and Permits Issued Under the Migratory Birds Convention Act

Nature of Permit or Licence	Number Issued
To collect birds for scientific purposes.....	427
For local control of great black-backed gull.....	1
To take migratory birds for propagation.....	11
To possess migratory birds for propagation.....	781
For bird-banding.....	256
For taxidermy.....	58
TOTAL.....	1,534

16. Distribution of Wildlife Publications

Publication	Number Issued
Consolidation of Migratory Birds Convention Act and Regulations.....	10,500
Abstracts of Migratory Birds Regulations.....	56,366
Educational and Instructive Pamphlets.....	22,429

Appendix D

1. Details of Stream Gauging

District Office	Gauging Stations	Discharge Measurements	Co-operating Agencies	Special Programs
Vancouver..... (Sub-offices in Kamloops, Nelson, Cranbrook, Prince George, Revelstoke, Whitehorse).	364 (250 all year)	1,444	British Columbia Water Rights Branch British Columbia Power Commission British Columbia Game Commission British Columbia Electric Co. Ltd. East Kootenay Power Co. Ltd. West Kootenay Power and Light Co. Ltd. Canadian Forest Products Co. Ltd. Crown Zellerbach Canada Ltd. C.B.A. Engineering Ltd. H.R. MacMillan Export Co. Ltd. (Pulp Division) Foundation of Canada Engineering Corporation Ltd. Northwest Power Industries Ltd. Granduc Mines Ltd. Greater Vancouver Water District Vancouver and District Joint Sewerage and Drainage Board City of Penticton Village of Abbotsford Creston Dyking District Department of Public Works Department of Fisheries Fisheries Research Board International Pacific Salmon Fisheries Commission United States Geological Survey United States Corps of Engineers Bonneville Power Administration United States Weather Bureau	Columbia River investigations. Yukon River investigations. Fraser River basin studies. Fisheries research.
Calgary..... (Sub-office in Shaunavon).	259 (68 all year)	2,587	Alberta Water Resources Branch Saskatchewan Water Rights Division Eastern Rockies Forest Conservation Board Canadian Utilities Ltd. Calgary Power Ltd. Consolidated Mining and Smelting Co. Ltd.	Co-operation with U.S. Geological Survey concerning apportionment of waters in the St. Mary and Milk Rivers basins. Measurement and study of flows in foothills streams under ice conditions.

1. Details of Stream Gauging—(Cont'd)

District Office	Gauging Stations	Discharge Measurements	Co-operating Agencies	Special Programs
			Structural Engineering Services Ltd. City of Calgary Northern Transportation Co. Prairie Farm Rehabilitation administration United States Geological Survey	Operation of special program to determine return flows from irrigation areas.
Winnipeg..... (Sub-offices in Keewatin and Fort Frances).	198 (119 all year)	1,118	Manitoba Water Resources Branch Hydro-Electric Power Commission of Ontario Saskatchewan Water Rights Division Saskatchewan Power Commission Manitoba Hydro-Electric Board Ontario Department of Planning and Development Churchill River Power Co. Ontario-Minnesota Pulp and Paper Co. Ltd. Prairie Farm Rehabilitation Administration United States Geological Survey United States Corps of Engineers	Lakes Winnipeg and Manitoba studies. Rating of Root River diversion channel. Investigation of the Gold Portage overflow from Lake Kabetogama to Rainy Lake.
Ottawa..... (Sub-offices in North Bay and Niagara Falls).	171 (147 all year)	581	Hydro-Electric Power Commission of Ontario Ontario Department of Planning and Development Quebec Department of Hydraulic Resources Kalamazoo Vegetable Parchment Co. Naugatuck Chemicals Canadian Johns Mansville Co. Great Lakes Power Co. Gatineau Power Co. Abitibi Power and Paper Co. International Nickel Co. Northern Quebec Power Co. Maclaren-Quebec Power Co. Spruce Falls Pulp and Paper Co. South River Electric Co. Pembroke Electric Commission Department of Public Works	Niagara River studies and assistance to international boards. Checking of power station ratings Preparation of discharge measurement facilities on Ottawa River near Grenville.
Montreal..... (Sub-office in Rimouski).	179 (171 all year)	532	Quebec Department of Hydraulic Resources Shawinigan Water and Power Co. Aluminum Co. of Canada, Ltd.	Metering of outflow and rating of storage reservoirs. Checking of power station ratings.

1. Details of Stream Gauging—(Cont'd)

District Office	Gauging Stations	Discharge Measurements	Co-operating Agencies	Special Programs
Montreal (Con't)			Gatineau Power Co. Price Brothers and Company Ltd. Quebec Power Co. Power Corporation of Canada Lower St. Lawrence Power Co. Quebec North Shore Power Co. Dominion Textile Co. Ltd. Canada Paper Co. Donnacona Paper Co. Gulf Power and Paper Co. City of Sherbrooke	Investigation of causes of flooding of Chaudière River at Beauceville, Quebec.
Halifax..... (Sub-office in St. John's, Newfoundland).	48 (43 all year)	257	Nova Scotia Power Commission New Brunswick Electric Power Commission Newfoundland Department of Economic Development Bowater Power Co. Gatineau Power Co. Newfoundland Light and Power Co. British Newfoundland Corporation Ltd. National Parks Branch United States Geological Survey.	Discharge measurements in Hamilton River basin. Checking of power station ratings. Measurements of flow in rivers near Strait of Canso.

2. Snow Surveys

District	Location	Co-operating Agency	Average Water Content of Snow Cover
Calgary.....	St. Mary River basin (May 1957) Bow River basin (April 1957) Cypress Hills (Feb.-March 1958) NorthSaskatchewan River (April 1957)	U.S. Geological Survey. — — —	120 per cent of previous 35-year average. 135 per cent of previous 20-year average. Lowest water content in 6 years of record. —
Winnipeg.....	Lake of the Woods basin (March 1958) Lac Seul (March 1958)....	U.S. Corps of Engineers. Hydro-Electric Power Commission of Ontario. Hydro-Electric Power Commission of Ontario.	52 per cent of median. 85 per cent of median.
Ontario.....	Central region—6 courses (March 1958)	Hydro-Electric Power Commission of Ontario.	Close to median in Wanapitei, Sturgeon, South and Magnetawan River basins; averaged 88 per cent of median in Muskoka River basin.

2. Snow Surveys—(Cont'd)

District	Location	Co-operating Agency	Average Water Content of Snow Cover
New Brunswick	Saint John and Lepreau River basins—11 courses (March 1958)	N.B. Electric Power Commission. Gatineau Power Co.	6.3 inches
Nova Scotia....	Barrington to Antigonish 12 courses (March 1958)	—	0.8 inch
Newfoundland..	5 courses (March 1958)....	—	0.4 inch

3. Boards on Which Resources Branch Has Membership

Board	Purpose	Details of Operation
FEDERAL-PROVINCIAL—		
Canadian Lake of the Woods Control Board	To regulate outflows from Lake of the Woods between water levels of 1056 and 1061 and to regulate outflows from Lac Seul.	Supervised the operation of control structures.
Lakes Winnipeg and Manitoba Board	To study possibilities of flood control, power development, and other uses of waters flowing into and out of these lakes.	Completed field surveys. First draft of main report nearly completed and 8 appendices to main report in various stages of preparation.
Prairie Provinces Water Board	To study the interprovincial waterway problems of the three prairie provinces.	Participated in studies of current and future water requirements.
Fraser River Board.....	To survey and report on the water resources and requirements of the area comprising the Fraser River Basin.	Carried out studies regarding flood control and power for various systems of river development; continued co-operative hydrometric survey program.
INTERNATIONAL—		
St. Croix River Board of Control.	To supervise water levels....	Maintained records of levels and inspected control structures.
Lake Memphremagog Board..	To supervise water levels....	Maintained records of levels.
Lake Champlain Board of Control.	To supervise water levels....	Maintained records of levels.
St. Lawrence River Board of Control	To supervise control of the levels of and outflow from Lake Ontario.	Approved plans and specifications for works in International Rapids Section of the St. Lawrence, in so far as those works would affect the levels and flows of the St. Lawrence River and Lake Ontario; computed pre-project levels and flows; continued studies for regulating Lake Ontario outflows.
Massena Board of Control....	To supervise diversion of water from St. Lawrence River by the St. Lawrence River Power Company and to maintain navigation levels at Lock No. 21.	Inspected control structure and maintained records. Effective 1 April 1958, this Board was dissolved, and its duties were assumed by the International St. Lawrence River Board of Control.

3. Boards on Which Water Resources Branch Has Membership—(Cont'd)

Board	Purpose	Details of Operation
Niagara Board of Control....	To supervise water levels and the construction of remedial works at Niagara Falls.	Maintained close check on levels above falls. Inspected construction of remedial works prior to their completion in July 1957; undertook to determine the operating limits for the control structure and to provide an operating procedure.
Niagara Committee.. . . .	To determine water available for power under Niagara Treaty of 1950.	Supervised diversions under the Niagara Treaty.
Lake Superior Board of Control	To regulate lake levels and supervise diversions for power.	Supervised the operation of the control structure.
Prairie Portage Board of Control	To supervise water levels at Prairie Portage following completion of dam.	Construction has been discontinued; Board has therefore been inactive.
Rainy Lake Board of Control.	To regulate levels and outflows of Rainy and Namakan Lakes.	Supervised the operation of the control structures.
Lake of the Woods Control Board	To regulate outflows from Lake of the Woods below water level 1056 and above water level 1061.	Supervised the operation of the control structure.
Souris River Board of Control.	To supervise the interim allocations of water of the Souris River.	Maintained record of runoff conditions and changes in water licences.
St. Mary and Milk Rivers....	To supervise the division and use of the waters of these rivers.	Supervised apportionment of waters.
Kootenay Lake Board of Control	To supervise water levels....	Supervised operation of Corra Linn dam.
Columbia River Board of Control	To supervise water levels....	Maintained records of water level of Columbia River at International Boundary.
Osoyoos Lake Board of Control	To supervise water levels....	Supervised operation of Zosel Dam.
Passamaquoddy Engineering Board	To investigate and plan the development of power from the tides of Passamaquoddy and Cobscook Bays.	Made extensive field surveys, also studies related to project layout, power markets, and generation of tidal and auxiliary power.
Saint John River Engineering Board	To study the water resources of the Saint John River Basin.	Maintained a watching brief on developments in the Saint John River Basin.
St. Croix River Engineering Board	To investigate the water resources of the St. Croix River Basin and to recommend projects for further study.	Completed preliminary investigation and submitted report to the International Joint Commission.
Lake Ontario Board of Engineers	To study factors affecting the levels of Lake Ontario and to make recommendations as required under reference of 25 June, 1952.	Studied factors affecting the levels of Lake Ontario; completed reports on several regulation plans; commenced drafting of final report to the International Joint Commission.

3. Boards on Which Water Resources Branch Has Membership—(Cont'd)

Board	Purpose	Details of Operation
Co-ordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data	To secure international agreement on basic data related to the Great Lakes Drainage Basin.	Continued to work toward agreement on basic flow data, crustal movement, and basic hydraulic and hydrologic data.
Souris-Red Rivers Engineering Board	To study water resources of Souris and Red Rivers and to make recommendations thereon to the International Joint Commission.	Continued the collection and study of related hydraulic data. The Board's studies provided the basis of a report dated 19 March, 1958, by the International Joint Commission to the two governments.
Columbia River Engineering Board	To study water resources of Columbia Basin in order to develop plans for ultimate use.	Continued field work and studies related to design of dams on Columbia River and tributaries in Canada, also system studies related to various proposed national and international schemes of development.

4. Developments Under Dominion Water Power Regulations

Development	Date Licensed	Power Output Kwh-1957	Water Rental Received for 1957	Other Details
			\$ cts.	
Porter Creek (Yukon Hydro Co.).....	March 1952	3,920,208	515 90	
McIntyre Creek (Yukon Hydro Co.).....	March 1955	3,028,453	450 00	Final licence issued 9 January, 1958.
Lake Minnewanka and Cascades (Calgary Power Ltd.).	May 1947	52,665,800	7,384 15	
Yellowknife (Consolidated Mining and Smelting Co.)...	Dec. 1942	25,578,200	3,155 69	
Lake Louise (C.P.R.).....	May 1919	—	—	New licence under preparation.
Ghost (Calgary Power Ltd.).	May 1947	166,367,500	24,630 54	Federal share of rental collected for Indian Affairs Branch.
Kananaskis (Calgary Power Ltd.).....	Oct. 1912	—	3,898 63	Federal share of rental collected for Indian Affairs Branch.
Horseshoe (Calgary Power Ltd.).....	Oct. 1909	—	10,000 00	Federal share of rental collected for Indian Affairs Branch.
Astoria (Northland Utilities Ltd.).....	-	—	—	Final licence under preparation.

5. Technical Assistance to Federal Agencies

Agency	Assistance by Water Resources Branch
Department of External Affairs.....	Membership on 4 international boards and provision of technical advice on international waterway problems.
International Joint Commission.....	Membership on 19 international boards and provision of technical advice to those on associated problems.
Department of Fisheries—	
Fish Culture Development Branch.....	Conduct of special hydrometric survey program.
Fisheries Research Board.....	Conduct of special hydrometric survey program.
International Pacific Salmon Fisheries Commission.....	Conduct of special hydrometric survey program.
Department of Agriculture—	
Prairie Farm Rehabilitation Administration.	Co-operation in hydrometric surveys for irrigation purposes.
Department of Public Works.....	Co-operation in hydrometric surveys for regulation of Okanagan Lake and Lake Nipissing and with respect to Ottawa River.
Department of National Health and Welfare..	Supply of hydrometric survey data.
Department of Northern Affairs and National Resources—	
National Parks Branch.....	Supervision of river diversions in Banff National Park. Conduct of special hydrometric survey program.
Northern Administration and Lands Branch, Lands Division.....	Administration of certain federal lands in British Columbia.

Appendix E

1. Research in the Economics of Forestry

Economic Analysis of the Spruce Budworm Epidemic

In connection with the federally-assisted spruce budworm spraying program in New Brunswick, an economic study was made of the losses resulting from the spruce budworm infestation. A report for departmental use was prepared in co-operation with the Operations Division.

Analysis of Forestry Statistics

The continued revision of statistics on primary forest production, in co-operation with the Dominion Bureau of Statistics, has resulted in completely revised estimates of annual production for the years 1940 to 1955. These were published in the *Amendments, 1958, to Forest and Forest Products Statistics, Canada*, which included also a revision of the National Forest Inventory.

Forestry Study Group—Royal Commission on Canada's Economic Prospects

By mid-year the co-ordination of the work of this group and the compilation of a significant part of the required statistics were completed, followed by the publication by the Royal Commission of *The Outlook for the Canadian Forest Industries*.

Preparation of International Reports

Economic and statistical reports were prepared for the Food and Agriculture Organization and the Economic Commission for Europe. Summaries of national and international forestry statistics were compiled for the use of the Canadian delegation to the Ninth Session of the FAO Conference.

2. Annual Forest Depletion ¹

	Millions of Cu. Ft. of Usable Wood		Percentage of Depletion	
	1946-55	1956 ²	1946-55	1956
Products utilized:				
Logs and bolts.....	1,406	1,607	42.9	38.7
Pulpwood.....	1,195	1,510	36.4	36.4
Fuelwood.....	402	284	12.3	6.8
Other products.....	80	60	2.5	1.4
TOTAL.....	3,083	3,461	94.1	83.3
Wastage:				
By forest fires.....	193	693	5.9	16.7
GRAND TOTAL.....	3,276	4,154	100.0	100.0

¹ Does not include wastage caused by agencies other than fire, such as insects, diseases, and natural mortality, for which no reliable estimates are available.

² Preliminary estimate.

3. Forest Industries

SUMMARY OF PRINCIPAL STATISTICS, 1955

	Number of Employees	Salaries and Wages	Net Value ¹ of Production	Gross Value of Production
		\$	\$	\$
Woods operations.....	149,000 ²	506,000,000	729,113,769	829,572,714
Pulp and paper industry.....	62,205	265,298,119	689,818,173	1,326,938,138
Lumber industry.....	58,586	152,556,819	296,940,188	644,482,990
Wood-using industry.....	75,087	201,883,078	334,917,793	730,108,828
Paper-using industry.....	27,545	84,478,930	177,443,414	428,106,801
TOTAL.....	372,423	1,210,216,946	2,228,233,337	3,959,209,471

¹ Net value of production is gross or sale value, less cost of materials, fuel, purchased electricity, and process supplies consumed.

² Man-year basis (300 working days).

4. Research Work of Forest Research Division

SILVICULTURE AND RELATED RESEARCH

Forest Classification

Continuing studies of forest types and forest sites to develop descriptive and classificatory methods useful in forestry practice. It is agreed that integrated ecological studies, rather than those emphasizing either vegetation or habitat alone, will provide the best foundation for forest and forest-land classification. On this basis research work is continuing in Newfoundland, Quebec, Ontario, and the Prairie Provinces. A provisional text to accompany the new (1956) forest classification map for Canada was prepared for distribution in mimeographed form.

Ecology and Silvics

Controlled experimental studies of the responses of tree seedlings to variations in soil nutrients, moisture, light and temperature; site requirements of tree species, site improvement, and research on the influences of frost during the growing season; observations on phenology and on the periodicity and amount of cone production in spruce and pine; studies of translocation in trees using radioisotopes, and physiological investigations of the flowering and fruiting processes in conifers. Continuation of taxonomic work, with collections of forest plants and the preparation of manuals and keys to assist identification. Ecological studies of the black spruce forest type in Alberta, of spruce-poplar in Saskatchewan and Manitoba, of aspen-birch-spruce-fir and yellow birch-sugar maple in Ontario, and of the spruce-fir type in Quebec, Newfoundland, and the Maritimes Provinces.

Applied Silviculture

Cutting experiments for the improvement or regeneration of forest stands in all districts on company lands and on experimental areas administered by the Branch. The principal studies in progress were with lodgepole pine and white spruce in Alberta; jack pine and red pine at Sandilands, black spruce at Duck Mountain; white spruce-aspen at Riding Mountain, Manitoba, and at Carrot River, Saskatchewan; spruce-balsam-birch-aspen at Heron Bay, tolerant hardwoods at Haliburton in Ontario; red and white pine at Coulonge, red spruce-fir-birch at Lake Edward, and balsam fir at Matane River, Quebec; maple-birch and old field white spruce in Nova Scotia; spruce-fir at Green River and Acadia, New Brunswick; spruce-balsam and balsam-white birch in Newfoundland. Most districts also conducted studies of seedbed improvement techniques using scarification, herbicides, or controlled burning.

Growth and Yield

Continuation of sample plot establishment or remeasurement which will result in empirical or normal yield tables for important species in each district. Special consideration was given to black spruce types and to the correlation of these studies with methods of assessing site productivity.

Reforestation and Tree Breeding

Experimental plantings and direct seedings at all Forest Experiment Stations and in most provinces. Tree breeding program at the Petawawa and Acadia Forest Experiment Stations with particular emphasis on provenance tests with spruce, jack pine, and balsam fir; co-operation in tree breeding with industry, including a large-scale seed collection for a white spruce provenance study; investigations to produce fast-growing and resistant strains of different species and species hybridization; further progress in grafting techniques with conifers; development of plantations; selection, testing, and collection of material from superior trees.

Forest Management

Collection of basic data in each district for management of selected and important forest types; operation of demonstration woodlots on an experimental basis. Continued work on an area at Petawawa to practice and demonstrate intensive silviculture; assistance to Alberta and Newfoundland in developing forest management plans.

Mensuration

Checking continued on promising mathematic functions developed to express tree volume and growth relationships. Data processing unit established at Ottawa to compile and compute research data by mechanical tabulation and punch cards.

FOREST INVENTORIES SECTION

Preparation of Stand Volume Tables

Volumetric data for use by the air photograph interpreter in making estimates of timber quantities collected in the field in accordance with four determinants: canopy density, average height weighted by volume, cover type and site type. Three hundred and seventy-six sample plots were measured, and compilation by data processing unit was undertaken, facilitated by the use of a base table for tree volumes.

Determination of Most Suitable Methods of Air Photography

Research in the use of various cameras and films to increase the accuracy of fine tree measurements in air photographs and to facilitate the identification of tree species. Air photographs taken for forest inventory with a new lens were studied. Camouflage detection photographs were taken on budworm-infested and other areas to determine their value in identifying dead foliage, distinguishing species, and determining tree vigour.

Development of Instruments

Advances in the technique of using air photographs for forest inventory purposes are accompanied by demands for new or improved instruments. A paper on the economies provided by the Rapidograph pen in marking air photographs was prepared for publication. A special table to facilitate the use of the Seelyscope in plotting forest type lines was constructed.

Investigation of Forest Survey Techniques

Research in field sampling procedures and air photograph interpretation. Five hundred and seventy-eight sample plots were measured to test the application of stand volume tables. Seven hundred and five point samples were measured to test, under Canadian conditions, a new method of forest sampling based on the use of the relascope.

FIRE PROTECTION SECTION

Forest Fire Danger Tables

Field studies at temporary specially selected research stations at two widely separated locations in British Columbia to obtain basic data for use in preparing fire danger tables. Related projects at the Petawawa and Kananaskis Forest Experiment Stations. Analyses nearly completed of the field data taken to prepare new, individual fire danger tables for Saskatchewan and Alberta. Major portion of the work done toward the publication of a fire danger rating manual.

Weather in Relation to Fire Danger and Fire Behaviour

Field studies on the effect of mountainous topography on fire danger measurements and on going fires were continued at the Kananaskis Forest Experiment Station, and an analysis of the data was well advanced. An article on the accuracy of the hair hygograph was prepared for publication by the Meteorological Branch. The new fire research laboratory at the Petawawa Forest Experimental Station was equipped to make certain fundamental studies to augment field investigations of fire weather and fire behaviour.

Fire Season Severity

A method of rating the relative severity of fire seasons from year to year, or from region to region, within a given protection organization has been developed with the use of the records of small test fires as the basic research tool—the results are being prepared for publication. Many practical applications of the rating are foreseen.

Fuel Type Classification

Preparatory work done to commence field investigations of methods for classifying and mapping fuel types in 1958 in co-operation with the Ontario Department of Lands and Forests.

Increasing the Effectiveness of Forest Fire Control

Production of a 20-minute colour training film on fire detection and fire danger rating; completion of field studies on the characteristics of back-pack pumps used in Canada; observation of experimental control burns and publication of the results; continued studies of herbicides, efficiency of various forestry hose lays, and techniques for selecting sites for lookout towers.

5. Forest Fire Losses in Canada, 1956

(Compared with 10-year average 1946-55)

Item	Provinces		Yukon and N.W.T.	
	Annual Average 1946-55	1956	Annual Average 1946-55	1956
Total number of fires.....	5,281	5,486	96	99
Total area burned (acres).....	1,436,443	2,014,043	692,153	92,419
Size of average fire (acres).....	272	367	7,210	933
Saw timber burned (M ft. b.m.).....	337,234	563,953	13,438	—
Small material (cords).....	1,256,892	6,755,398	196,583	71,901
Actual cost of fire fighting.....	\$ 2,635,609	\$ 2,845,106	\$ 43,444	\$ 34,615
Other fire protection costs (1955).....	—	\$ 18,881,582	—	\$ 133,798
Area under protection (sq.mi.).....	—	1,117,169	—	125,000

6. Reforestation Under the Forestry Agreements

	Number of Trees Planted		Area Planted		Area Seeded	
	Fiscal Year 1957-58	Total to Date	Fiscal Year 1957-58	Total to Date	Fiscal Year 1957-58	Total to Date
			acres	acres	acres	acres
Prince Edward Island.	79,000	330,000	55	266	—	—
Nova Scotia.....	256,000	722,000	294	855	—	—
Ontario.....	—	55,790,000	—	55,790	—	6,000
Manitoba.....	1,127,000	4,120,000	886	3,529	—	—
Saskatchewan.....	184,000	1,392,000	165	1,103	256	1,262
British Columbia.....	—	11,949,000	—	14,160	—	—
TOTAL.....	1,646,000	74,303,000	1,400	75,703	256	7,262

7. Payments to Provinces Under the Inventory and Reforestation Agreements

Province	Forest Inventory		Reforestation		Total Federal Payments	
	Fiscal Year 1957-58	Total to Date	Fiscal Year 1957-58	Total to Date	Fiscal Year 1957-58	Total to Date
	\$	\$	\$	\$	\$	\$
Prince Edward Island...	—	—	16,036	85,639	16,036	85,639
Nova Scotia.....	10,920	307,550	3,930	8,944	14,850	316,494
New Brunswick.....	17,545	129,328	—	—	17,545	129,328
Ontario.....	220,633	1,759,587	19,788	592,008	240,421	2,351,595
Manitoba.....	19,390	326,135	11,274	53,464	30,664	379,599
Saskatchewan.....	23,774	251,937	2,098	13,911	25,872	265,848
Alberta.....	58,519	539,379	—	—	58,519	539,379
British Columbia.....	462,390	2,917,205	—	137,181	462,390	3,054,386
TOTAL.....	813,171	6,231,121	53,126	891,147	866,297	7,122,268

8. Payments to Provinces Under the Forest Fire Protection and Access Roads and Trails Agreements

Province	Fire Protection	Access Roads and Trails
	Fiscal Year 1957-58	Fiscal Year 1957-58
	\$	\$
Newfoundland.....	33,913	2,872
Prince Edward Island.....	1,518	—
Nova Scotia.....	20,532	14,141
New Brunswick.....	36,862	29,833
Ontario.....	152,598	249,247
Manitoba.....	42,049	118,214
Saskatchewan.....	49,503	95,056
Alberta.....	62,096	23,642
British Columbia.....	100,929	77,363
TOTAL.....	500,000	610,368

9. Aerial Spraying—New Brunswick and British Columbia

Province	Area Sprayed		Federal Payments	
	Fiscal Year 1957-58	Total to Date	Fiscal Year 1957-58	Total to Date
	acres	acres	\$	\$
New Brunswick.....	5,195,000	11,439,000 ¹	985,729 ²	3,250,000
British Columbia.....	156,000	156,000	83,927	83,927
TOTAL.....	5,351,000	11,595,000	1,069,656	3,333,927

¹ Gross area, including re-spraying. Net area sprayed, approx. 5,195,000 acres.

² An additional sum of \$131,577 was paid out of the 1958-59 appropriation.

10. Forest Products Laboratories of Canada

Under main headings, research work is shown separately hereunder for the Ottawa and Vancouver Laboratories. The work of the latter is mainly concerned with British Columbia and Alberta timbers and forest-based industries.

Timber Engineering

Ottawa

Continuing accumulation of basic data on the mechanical and physical properties of Canadian timbers. Basic research on the behaviour of nailed joints and on the impact strength of glued surfaces. Studies on the effect of knots on the strength of end joints in glued laminated construction. The development of designs of economical, nailed wooden trusses for house construction, and investigations into the strength of laminated crossarms.

Vancouver

Testing of woods and wood structures to determine strength properties, including variability statistics. Continuing calculations of working stresses for structural timber. Studies of mechanical and physical properties of lodgepole pine mine timbers and fast-growth Douglas fir in relation to various growth zones within the tree.

Containers

Ottawa

Investigations into the actual hazards to which containers are subjected in transit. Studies on sheathed containers incorporating various materials and fastening devices. Continuing investigations into the design and strength of containers manufactured from wood and wood-based materials. Studies of more efficient methods of packing and shipping goods for National Defence and Agriculture.

Veneers, Plywood, and Adhesives

Ottawa

Studies on the strength and durability of wood adhesives and improved test methods; development of standard tests for glued laminated wood products; evaluation of balsam poplar for plywood manufacture; fundamental studies on the formation of veneer cutting defects and their effect on the properties of plywood.

Vancouver

Determination of the effect of drying temperatures on the gluing properties and quality of Engelmann spruce veneer. Calculations of percentage wood failure in plywood

removed from exposure fence. Analysis of strength data obtained from drying Douglas fir veneers at high temperatures. Collation of strength in static bending data of Douglas fir plywood.

Physics

Ottawa

Development of a non-destructive testing technique, employing sonic vibrations, for detecting inferior bonds in laminated wood products; studies on the dielectric properties of wood adhesives and methods of evaluating these properties.

Wood Preservation

Ottawa

Performance records of service installations are being kept up to date, including posts, poles, railway ties, and pilings treated with various preservatives by different methods. Continuation of treatment studies for green fence posts with special consideration of the possibility of do-it-yourself treatments by farmers, using simple equipment (tanks). Studies of the mechanisms of wood penetration by liquids and their modification by addition of certain compounds. Application of radio-active isotopes for penetration studies. Improvements in the statistical methods of evaluating preservatives. Non-pressure treatments (dip, brush) for material subject to moderate decay hazards (mill work).

Vancouver

Studies of effect of high bath temperatures in improving the penetration of creosote into mountain type Douglas fir. Analyses of factors affecting the penetration and retention of creosote in western hemlock poles. Analyses of the relationship between creosote retention and duration of boiling, and development of formula on influence of variables.

Pathology

Ottawa

Studies to determine the relative importance of the fungi isolated from decayed wood in buildings and in service outdoors, their relation to the preservative treatment used, and the inter-relation between the primary wood-decaying fungi and the other associated fungi isolated from the areas of decay. The effect of common blue-staining and other wood-inhabiting fungi on the strength properties of the wood. The effect of moulds and other antagonistic fungi in retarding development of decay in stored birch logs. The identification, isolation, and maintenance in culture, for reference purposes, of wood-decaying and sapwood staining fungi.

Vancouver

Identification of fungi and wood samples, and assessment of cause and significance of various decays. Observation and description of defects and abnormalities in woods by anatomical examination. Determination of the relative durability of western red cedar heartwood under controlled laboratory test conditions of softwood plywood and of the decay resistance of wood treated with copper naphthenate.

Paints and Coatings

Ottawa

Attempts to improve the method for evaluating fire retardancy of coatings. Durability of exterior coatings under a wide range of climatic conditions. Bleaching of defects in wood. Influence of paint pigments on blistering of paints. Effect of species on durability of exterior coatings. Painting of creosote-treated wood. Behaviour of paint coatings on treated millwork. Finishes for hardwood flooring. Paints and protective coatings for Douglas fir plywood and hardboard.

Chemistry

Ottawa

Defiberization studies on pulpwood bark for production of fibre for structural boards. Dimensional stabilization of wood by chemical modification. Analysis and evaluation of tension wood in hardwoods used for pulping. Separation of the main components of wood by mild chemical agents.

Vancouver

Development of new technique for separating individual isomers from the thujaplicin mixtures obtained from western red cedar. Preparation of samples of beta, gamma, and hydroxy thujaplicin, methyl ethers of these substances, and other chemicals for pharmaceutical testing. Examinations of infra red absorption spectrum of various derivatives and of plicata acid from western red cedar.

Microbiology

Ottawa

Investigations of bacterial fermentations of wood waste were continued, aiming at the production of useful products. Pre-treatment and experimental conditions for fermentation of wood; isolation of the growth factor in rumen fluid necessary for growth of rumen bacteria; isolation of an enzyme system from rumen organisms; and mechanism of fermentation of cellulose by rumen organisms.

Milling

Ottawa

New mill using travelling headsaw and stationary carriage completed and preliminary studies begun. A headsaw shadow-line projector completed and installed. Studies on the use of chips from sawmill waste for pulp. Chip sampling programs being developed. Appraisal of potential future expansion of chip utilization. Studies on log barking. Studies into factors influencing production of charcoal in Canada.

Vancouver

Analysis of the lumber recovery values of alpine fir (balsam) logs. Determination of relationships between log values and visually detectable decay in standing tree. Compilation of data on sawing times before and after the installation of a whole-log barker in a mill. Studies of the effect of ambrosia beetles on the yield and quality of saw logs.

Logging

Ottawa

Data available on the effect of tree size on harvesting and conversion. Log grading system for yellow birch and hard maple completed and similar studies continuing on softwoods. Surveys into conversion and utilization of forest products in specific areas.

Vancouver

Analysis of tractor yarding studies completed at several logging operations in the southern interior of British Columbia. Logging research studies in co-operation with University of British Columbia. Review of problems appertaining to logging in the Pacific Northwest.

Seasoning

Ottawa

Data available on the effect of fluctuation of moisture content of seasoned wood in use. Studies on the kiln-drying of white pine continuing. Data obtained on the storage of lumber in paper and other wrappings. A new high-temperature kiln under construction.

Additional data available on the equilibrium moisture content of wood in use in buildings. Annual kiln course conducted for representatives of industry on improved drying techniques and proper application of seasoning principles.

Vancouver

Measurements of shrinkage of lumber during kiln-drying. Continuing studies on the effect of high temperature rapid kiln-drying on the quality of lumber. Studies of circulation and preparation of data showing air measurements in different types of dry-kilns, and of climatic conditions at major lumber producing centres in British Columbia.

Wood Structure

Ottawa

Effects of anatomy on technological properties of wood were continued, including the tracing of the origin of internal separations induced in moist wood by industrial processing and in wood exposed to repeated drying and wetting. Studies continued on the paths followed by forced penetration of oil-type preservatives in wood and on effects of reaction wood on strength and related properties. Appraisal of properties of wood from plantation forests was undertaken. Identification of timber, appraising causes of defects in wood products and remedial suggestions.

Vancouver

Collation of data on spiral grain and investigation of the effect of stimulated growth on the severity of spiral grain in alder, and the development of microphotographic technique for the measurement of microfibrils. Measurement of fibres in Douglas fir seedlings from a single parent tree but planted on different sites.

Appendix F

(Natural History Branch and Human History Branch)

National Museum: Education Section

The interpretation of the work and materials of the Museum to the general public, and particularly to young people, is the responsibility of the Education Section. This exposition is carried on by means of guided tours, lectures, film showings, and the sale or loan of photographs, lantern slides, film strips, and motion picture films.

Adult Lectures in English

The regular Wednesday night series of public lectures was continued during the autumn, winter, and early spring. Seventeen lectures were given, ranging in subject from geological exploration to space travel, with geography, anthropology, and natural history well represented. Total recorded attendance was 5,105, which represents a falling off from the attendance of the previous year. This may reflect the growing competition from other forms of entertainment and adult education. The following is the list of lectures in this series:

The British Isles—by Neil Douglas, Meriden, Conn., U.S.A.

Exploring the Eskimo's Past—by W. E. Taylor, M.A., National Museum of Canada, Ottawa.

British Columbia—by J. M. Humphrey, Vancouver, B.C.

The Lost Animals in the Southern Hemisphere—by Thomas W. Cameron, M.A., Ph.D., D.Sc., Professor of Parasitology, Macdonald College, Ste Anne de Bellevue, P.Q.

The Kingdom of Kommagene—by H. G. Bachmann, Ph.D., National Research Council, Ottawa.

Wind, Clouds, and the Rain—by K. T. McLeod, B.Sc., M.A., Superintendent, Canadian Public Weather Services, Toronto.

Waves—by W. M. Gray, M.A., Ph.D., Mines Branch, Dept. of Mines and Technical Surveys, Ottawa.

The Antiquity of Man in America—by George F. Carter, A.B., Ph.D., The Johns Hopkins University, Baltimore, Md., U.S.A.

Jewish Folksong Recital—by Ruth Rubin, Jewish Folksinger (Yiddish), New York, U.S.A.

Puppet Films—Czechoslovakia.

Geological Mountain Exploration—by E. F. Roots, Ph.D., Geological Survey of Canada, Ottawa.

South African Mosaic—by His Excellency, Jan R. Jordaan, High Commissioner for the Union of South Africa.

Primitive New Guinea—by G. P. Holland, Entomology Division, Department of Agriculture, Ottawa.

Allan Mills Sings—Allan Mills, folksinger, Montreal.

Rockets, Earth Satellites, and Space Travel—by Gordon D. Watson, Director, Weapons Research, Defence Research Board, Ottawa.

Australian Bushmen (and the cold)—by J. S. Hart, National Research Council, Ottawa.

Oddities of the Sea—by Dr. John F. Storr, University of Miami, U.S.A.

Adult Lectures in French

Three lectures in the French language were given, with a total attendance of 1,040. These were as follows:

Le folklore gaspésien—Mlle Carmen Roy, National Museum of Canada, Ottawa.
La vie des Indiens des Andes—Le docteur Jehan Albert Vellard, Directeur-fondateur de l'Institut français d'Études Andines.

Les Traditions populaires suisses—M. le professeur Joseph Szoverffy de la Faculté des Arts, Université d'Ottawa.

Children's Programs

The Saturday morning programs for children continue to arouse much interest, though some subjects have a greater appeal than others. Twenty talks or film showings were offered during the period October to April, with a recorded attendance of 10,945. The following were the subjects:

South Africa—films and talk by W. F. Van Eyssen, Information Adviser of the Embassy of the Union of South Africa.

Canada's East Coast—4 nature films.

Forest Fires—films and a talk by J. C. McLeod of the Forestry Branch.

Royal Tour in the South Pacific—film and a talk by Ian Spencer.

"Battle of the Budworms" and the "Plywood Story"—2 films.

"Man of Aran"—Robert J. Flaherty film.

Puppet colour films—Embassy of Czechoslovakia, Ottawa.

New African Dominion—films and talk on Ghana by E. Jackson.

"Scrooge"—film.

"Tales of Robin Hood", "Robinson Crusoe"—two feature films.

Totem Poles—movie and talk by Reginald Kelly, Indian Affairs Branch, Dept. of Citizenship and Immigration, Ottawa.

Space Travel—talk by R. W. Tanner of the Dominion Observatory, Ottawa.

Malaya—film and talk by Dr. G. C. Monture, Ottawa.

Nature Film Program.

Folk Songs—Tom Kines.

"Captain Courageous"—feature film.

A tour of the West Indies—Gordon Merrill, Carleton University, Ottawa.

Waves—talk by W. M. Gray.

Underwater film program.

U.K. Travelogue—film program on the British Isles.

Special Programs

Special lectures or film showings were offered when distinguished scholars were available, or when a special exhibition was being opened to the public. Seventeen such presentations were offered, with a total attendance of 13,849. In addition, the film series "Canada in Colour", shown during the summer, drew a total audience of 8,275.

Reindeer Breeding in Europe and Asia—by E. J. Lindgren, M.A., Ph.D., Royal Central Asian Society, London, England.

Red Ochre and Rituals—Dr. J. Norman Emerson, University of Toronto.

Exhibit Film Showing: "Nanook of the North" (April 1-29).

Exhibit Film Showing: "Hunting Animals of the Past".

Opening of Irish Folklore Exhibit—film showing during exhibit.

Irish Concert.

Robert J. Flaherty Film "Man of Aran".

French Canadian Folk Dances—by les Folkloristes du Québec.

The Sikhote-Aline Meteorite—Russian film with introduction by Peter M. Millman, A.M., Ph.D., National Research Council, Ottawa.

Royal Journey—film showing.

English Literature and the Screen—Dr. Roger Manvell (program in connection with the Ottawa Film Council, The Ottawa Film Society, The University of Ottawa Cine Club).

Forestry Exhibit Opening: film showings during exhibit.

Opening of West Coast Indian Exhibit.

A Canadian's Camera View of Russian Life—Col. J. H. Jenkins, Chief, Forest Products Laboratories of Canada (given in connection with Forestry Branch), Ottawa.

Talk and Film on Totem Poles—Reginald Kelly, Indian Affairs Branch, Dept. of Citizenship and Immigration, Ottawa.

C.B.C. Films "People of the Potlatch" and "The Village".

Opening of Exhibit "Shells of the World".

"Canada in Colour" summer film series (attendance 8,275).

Tours

Groups conducted through the Museum exhibition halls totalled 106. Of these, the most noteworthy were the following groups: Rotary Club's "Adventure in Citizenship"; Royal Military College of Canada; Ottawa Y.M.C.A. Day Camp; High School students sponsored by the United Nations; Stratford Teachers' College; North Bay Teachers' College.

Lecture Hall

The lecture hall and projection facilities of the Museum are available for use by educational and other organizations. Twenty-five such bodies made use of this service during the year:

Logan Club (Geological Survey of Canada), Public Schools of Ottawa, Ottawa Citizen's Forum, Appalachian Club, American Society of Tool Engineers, Ottawa Valley Aquarium Society, Ottawa Junior Music Club, Science Film Group, Ottawa Fish and Game Association, Ottawa Film Society, Czechoslovakian Embassy, Colour Photography Association, National Gallery of Canada, German Language Club, Theatre Foundation of Ottawa, Mineralogical Association of Canada, Rotary Club, United Nations Association in Ottawa, Biological and Anthropological Group of the Professional Institute, Ottawa Art Association, Emergency Air Corps, Maritime Provinces Association, The Royal Canadian Geographical Society, Ottawa Field-Naturalists' Club, The Department of Mines and Technical Surveys.

Lectures

By W. K. W. BALDWIN:

Exploring the Hudson Bay Lowlands. The Macoun Field Club, Ottawa.

Vegetation of the Clay Belt of Northern Ontario and Quebec. Ontario Research Foundation, Toronto.

By A. W. F. BANFIELD:

The Canadian Caribou Research Program. Northeast Wildlife Conference, Montreal.

Caribou. The Macoun Field Club, Ottawa.

By S. BLEAKNEY:

Amphibians and Reptiles of Southern Alberta. The Macoun Field Club, Ottawa.

Dogfish Anatomy. The Macoun Field Club, Ottawa.

Sharks. The Macoun Field Club, Ottawa.

By E. L. BOUSFIELD:

Maintenance and Dispersal of the Larvæ of Barnacles and Other Fouling Organisms in Estuaries. Marine Laboratory, Friday Harbor, Washington, D.C.

Freshwater Crustaceans of the Ottawa Region. The Macoun Field Club, Ottawa.

Transport and Concentration of Planktonic Animals in Estuaries. Northeast Wildlife Conference, Montreal.

Interesting Your Child in Nature. Churchill Avenue Home School Association, Ottawa.

Seashore Life of Canadian Atlantic and Pacific Coasts. Carleton University Science Club, Ottawa.

By A. W. CAMERON:

Canadian Bats. The Macoun Field Club, Ottawa.

Small Mammals of the Ottawa District. The Macoun Field Club, Ottawa.

By J. A. CROSBY:

Painting Canada's Wildlife. Hamilton Nature Club, Hamilton, Ont.

By W. E. GODFREY:

Arctic Birds. H.M.C.S. *Gloucester*, Ottawa.

Birds Across Canada. The Macoun Field Club, Ottawa.

By W. LANGSTON, Jr:

Drumheller, Seventy Million Years B.C. Public Lecture, Drumheller, Alberta.

By L. S. RUSSELL:

Dinosaurs and Dinosaur Hunters. Annual Meeting of the Canadian Museums Association, Calgary, Alta.

Continental Zoology of the North American Pleistocene. McCord Museum, McGill University, Montreal.

A Horse Astragalus from the Hand Hills Conglomerate of Alberta. Society of Vertebrate Paleontology, Atlantic City, N.J.

Dinosaurs and Dinosaur Hunting. Canadian Clubs, Smiths Falls and Kemptville, Ont.; Fredericton, St. Andrews, St. Stephen and Moncton, N.B.

The Environment of Prehistoric Man. St. Patrick's College, Ottawa.

By H. J. SCOGGAN:

Evergreen Trees. The Macoun Field Club, Ottawa.

Deciduous Trees. The Macoun Field Club, Ottawa.

BELLEAU-HAMBLETON, Thérèse

The Art and Artefacts of Pre-Historic Man. St. Patrick's College.

LEE, Thomas E.

Early Man in Canada, with References to American Finds. Ontario Archæological Society, Toronto.

Interview, subject "Sheguiandah", CBL TV, Tabloid, Toronto.

The Sheguiandah Site. Macoun Field Club, Ottawa.

MACNEISH, Richard S.

The Origin of Modern Foods. Scientists Wives' Association of the National Research Council, Ottawa.

Recent Finds on the Firth River and their Relevance to New World Migrations. Archæological Society of Montreal.

The Ecology of Plant Domestication. The Geography Class of McGill University. Ancient Migrations. Indian Aid Society, Whitehorse, Yukon Territory.

Recent Finds in the Southern Yukon. Whitehorse Historical Society, Yukon Territory.

Interviewed at CBO Ottawa, by Stephen Dale for Ontario School Broadcast of "Current Events".

Prehistoric Peopling of the New World. Radio speech, CBO, Ottawa.

Agriculture in the Prehistoric Eastern Woodlands. Discussant at the symposia organized at the American Anthropological Association Meeting.

Prehistoric Man Across the Pacific. Y.M.C.A. Discussion Club.

Exploring the Past. Engineers Wives' Association, Ottawa.

The Beginnings of Civilization. Carleton University Class.

Origin and Dispersal of New World Agriculture. McGill Pleistocene Seminar.

Firth River Finds. Brotherhood of Anglican Churchmen, St. Richards, Ottawa.

Problems of Canadian Arctic Archæology. Conference in Copenhagen, Denmark.

RIOUX, Marcel

Remarques sur le concept de structure sociale. ACFAS meetings in Quebec.

Sociologie de la religion. Commentaries on Dumont's paper, Quebec.

The Ethnography of French Canada. A series of lectures given at Carleton University from September to April.

Participation in four TV programs (Sociology of Religion, Prise de Bec, Vacances en Colombie-Britannique and Here and There), and two radio broadcasts ("The Indians" and Citizen's Forum, English network).

ROUSSEAU, Jacques:

L'Anthropobiologie du Québec boréal. Series of eight lectures. Laval University. Gastronomie canadienne. Laval University.

Les Indiens chasseurs. Le Cercle juif de langue française.

Medical Folklore in Eastern Canada. Plant Science Seminar, American Association of Pharmacists.

L'Indien de la forêt canadienne et le milieu écologique. La Sorbonne, Paris.

Man before Science. St. Patrick's College.

L'Indien de la forêt boréale. Université d'Ottawa.

Le milieu biologique et l'homme dans l'Ungava. Series of ten Saturday lectures. Institut de géographie, Université de Montréal.

TAYLOR, William E.

Tabloid, CBC, TV, Toronto, as guest.

Living with the Sugluk Eskimo. CBO, Ottawa.

Eskimo Archæology. CBO, Ottawa.

Archæology in Ungava. Arctic Circle, Ottawa.

Field Methodology and Techniques. Participant in discussion. McGill University Graduate Seminar in Archæology.

Appendix G

LIST OF PUBLICATIONS ISSUED 1957-58

National Parks Branch

Canadian Wildlife Service

Wildlife Management Bulletins

Series 1, Number 12. Continued Barren-ground Caribou Studies. John P. Kelsall.

Series 1, Number 13. Range Studies in Banff National Park, Alberta, 1953.

Robert Webb.

Translations of Russian Game Reports. Volume 1 (Beaver, 1951-55) and Volume 2 (Muskrat, 1951-55).

L'Art d'attirer les oiseaux en leur offrant le manger et le boire. (Pamphlet reprinted, fourth edition.)

Technical Articles

The Plight of the Barren-ground Caribou. A. W. F. Banfield. *Oryx* 4(1): 5-20. 1957.

Dropping Boards for Populations Studies of Small Mammals. W. A. Fuller (collaboration). *J. Wildlife Mgmt.* 21: 300-314. 1957.

On the Role of Rodents in the Epidemiology of Hydatid Disease in the Mackenzie River Basin. Harold C. Gibbs. *Can. J. Comp. Med.* 21(8): 287-289. 1957.

Seventh Census of Non-passerine Birds in the Bird Sanctuaries of the Gulf of St. Lawrence. Louis Lemieux. *Can. Field-Nat.* 70(4): 183-185. 1956 (Published 1957).

Là où couve la grande oie blanche. Louis Lemieux. *Les Carnets* 18(1): 11-18. 1958.

Movements of Trumpeter Swans Shown by Band Returns and Observations. R. H. Mackay. *Condor* 59:339. 1957.

Birds Observed at Bathurst Inlet, Northwest Territories. Eoin H. McEwen. *Can. Field-Nat.* 71(3): 109-115. 1957.

Annotated List of Birds of Part of the Back River, N.W.T. John S. Tener. *Can. Field-Nat.* 70(3): 138-141. 1956 (Published 1957).

Water Resources Branch

Water Resources Papers

No. 118. Pacific Drainage, Climatic Years 1952-53, 1953-54.

Mimeographed Reports

1. Hydro-Electric Progress in Canada, 1957, Bulletin No. 2598.

2. Water Power Resources of Canada, Bulletin No. 2602.

3. Principal Hydro-Electric and Hydraulic Developments in Canada with Turbine Capacities not less than 2,000 h.p., Bulletin No. 2600.

Forestry Branch

Technical Notes

No. 50 Forest Resources of the Avalon Peninsula, Newfoundland. W. C. Wilton.

No. 51 Occurrence and Effects of Summer Frost in a Conifer Plantation. René Pomerleau and R. G. Ray.

No. 52 Thinning in Lodgepole Pine Stands in Alberta. L. A. Smithers.

No. 53 Cutting and Seedbed Preparation to Regenerate Yellow Birch, Haliburton County, Ontario. J. M. Jarvis.

No. 54 Black Spruce Reproduction Under Disturbed Soil Conditions. A. Linteau.

- No. 55 Annual and Seasonal March of Soil Moisture Under a Hardwood Stand. D. A. Fraser.
- No. 56 Annual and Seasonal March of Soil Temperature on Several Sites Under a Hardwood Stand. D. A. Fraser.
- No. 57 Tolerant Hardwood Forests of Northern Nova Scotia. M. H. Drinkwater.
- No. 58 Influence of the Aspen Overstory on White Spruce Growth in Saskatchewan. J. H. Cayford.
- No. 59 Frost Hardiness of White Spruce and Red Pine Seedlings in Relation to Soil Moisture. J. W. Fraser and J. L. Farrar.
- No. 60 Light Measurement in a Study of White Pine Reproduction. E. S. Atkins.
- No. 61 The Effect of Partial Cutting in Even-aged Lodgepole Pine Stands. A. W. Blyth.
- No. 62 A Light Portable Tower to Facilitate Measurement of Vertical Gradients in Tree Studies. D. A. Fraser.
- No. 63 The Effect of Various Seedbed Treatments on the Germination and Survival of White Spruce and Lodgepole Pine Seedlings. R. F. Ackerman.
- No. 64 Effects of Manure on a White and Norway Spruce Plantation at Grand'Mere, Que. J. D. MacArthur.
- No. 65 Field Spruce in Nova Scotia. M. H. Drinkwater.

Miscellaneous Series

- No. 7 Christmas Tree Growing in Canada. W. M. Stiell.
- No. 7 La culture des arbres de Noël au Canada. W. M. Stiell.
- No. 8 Forest Inventories in Canada. H. E. Seely.
- No. 9 Forest Inventory and Reforestation Under the Canada Forestry Act, 1952 to 1956.

Miscellaneous—(Unclassified)

- Forest Conservation (5th edition)
- Mise en valeur de la forêt (2nd edition)
- List of Publications of the Forest Research Division, Forestry Operations Division, and Forest Economics Section
- Samples of Forest Fire Protection Posters
- Forest Fire Danger Tables (Newfoundland, New Brunswick, Ontario, Manitoba, and the East Slope of the Rocky Mountains)
- Forest Inventories in Canada. H. E. Seely. (Prepared for Seventh British Commonwealth Forestry Conference)
- Fence Posts and Poles from Lodgepole Pine Stands. L. A. Smithers. (Published by the Alberta Department of Lands and Forests)
- Croissance et développement des plantations de conifères de Grand'Mère, Que. G. C. Cunningham

Periodicals

Précis de protection des forêts contre le feu:

- Volume III No. 2
- Volume IV No. 1 and No. 2
- Volume V No. 1 and No. 2
- Volume VI No. 1 and No. 2
- Volume VII No. 1

Forest Fire Protection Abstracts:

- Volume VII No. 1 and No. 2
- Volume VIII No. 1

Canada's Forests, 1958
Les forêts du Canada, 1958
Annual Report on Forest Research for year ended March 31, 1957.
1958 Amendments—Bulletin 106—Forest and Forest Products Statistics

Reprints (Magazine Articles)

- Seeding and Planting White Spruce on Tolerant Hardwood Lands. M. H. Drinkwater. Reprinted from *Woodlands Review, Pulp and Paper Magazine of Canada*, June 1957, Vol. 58.
- Studies of Regeneration in Forest Stands Devastated by the Spruce Budworm. Part 1. D. A. Fraser, co-author. Reprinted from *Forest Science*, June 1957.
- Mineral Nutrient Content of some Forest Plant Leaves and of the Humus Layer as Related to Site Quality. D. Gagnon, co-author. Reprinted from *Canadian Journal of Botany*, March, 1958, Vol. 36, No. 2.
- Marking Air Photographs. F. W. Kippen. Reprinted from *The Canadian Surveyor*, March, 1958.
- Making the Most of the Weather. L. B. MacHattie. Reprinted from *Woodlands Review, Pulp and Paper Magazine of Canada*, June 1957. Vol. 58.
- The Rockland Red Pine Plantation. W. M. Stiell. Reprinted from *Timber of Canada*, April, 1957.
- Rapid Estimate of Volume in Red Pine Plantations. W. M. Stiell. Reprinted from *The Forestry Chronicle*, December, 1957, Vol. 33, No. 4.
- Two Control-burns in Jack Pine Cut-over. D. E. Williams. Reprinted from *Woodlands Review, Pulp and Paper Magazine of Canada*, Convention Issue, 1958.

Articles and Addresses

- Seeding and Planting White Spruce on Tolerant Hardwood Lands. M. H. Drinkwater. *Woodlands Review*, June 1957.
- Translocation of Rubidium and Calcium in Trees. D. A. Fraser. Mario Moors Cabot Foundation.
- Relation of Environment Factors to Flowering in Spruce. D. A. Fraser. Mario Moors Cabot Foundation.
- Studies of Regeneration in Forest Stands Devastated by the Spruce Budworm. Part I. D. A. Fraser, co-author. *Forest Science*, June, 1957.
- Mineral Nutrient Content of some Forest Plant Leaves and of the Humus Layer as Related to Site Quality. D. Gagnon, co-author. *Canadian Journal of Botany*, March, 1958, Vol. 36, No. 2.
- Canada's Stake in Forest Management. J. D. B. Harrison. *Pulp and Paper Magazine of Canada*, Vol. 58, No. 3, 1957.
- From Hardwood Slums to Productive Forests. J. M. Jarvis. *Canada Lumberman*, April 1957.
- Making the Most of the Weather. L. B. MacHattie. *Woodlands Review*, October 1957.
- Research in Forest Fire Control, 1957. J. C. Macleod. Paper presented to C.P.P.A. Meeting, *Woodlands Section*, August 1957.
- Rapid Estimate of Volume in Red Pine Plantations. W. M. Stiell. *The Forestry Chronicle*, December 1957, Vol. 33, No. 4.
- Patch Cutting in Second Growth Balsam Fir at Matane. R. G. Ray. Paper Presented to C.P.P.A. Meeting, *Woodlands Section*, August 1957.
- The Forests of Canada. H. M. Babcock. Article prepared for the *Royal Forestry Society of Belgium*.
- The Leading Role of Canada's Forest Industry. H. M. Babcock. *Financial Times*. London. February 24, 1958.
- Two Control-burns in Jack Pine Cut-over. D. E. Williams. *Woodlands Review, Pulp and Paper Magazine of Canada*, Convention Issue, 1958.

Limited Distribution—Mimeographed Reports

- The aspen-birch-spruce-fir type in the Boreal Forest Region of Ontario. D. W. Maclean.
- Standard volume tables for white spruce on alluvial soils in the Wood Buffalo National Park. G. B. Sully, F. W. Kippen, T. G. Honer.
- Investigation of root grafts between trees in Scots pine stands. (Condensed by Erika and D. A. Fraser from a publication by Paava Yli-Vaakuri—*Acta Forestalia Fennica* 60:103-117:1954)
- Farm Woodlot Management. (Re-issue from 1951) A. Bickerstaff.
- The Petawawa Forest Experiment Station, Chalk River, Ontario.
- Results of partial cutting in an over-mature even-aged stand of subalpine white spruce in Alberta. J. Quaite.
- Empirical yield tables for aspen on the Riding, Duck and Porcupine Mountains, Manitoba. H. J. Johnson.
- Jack pine regeneration—a review of literature. J. H. Cayford.
- Effect of controlled fire on the composition of reproduction in a spruce-fir stand. (B. C. Wile)
- Regeneration of lodgepole pine following strip clear cutting, mechanical scarification and slash disposal. (R. F. Ackerman)
- Spacing and survival tables for plantations. (W. M. Stiell)

Forest Products Laboratories of Canada**Bulletins and Technical Notes**

- Bulletin 119 Determination of the Strength and Physical Properties of Canadian Woods. W. E. Wakefield.
- Bulletin 120 Production of Wallboard from Wood Waste. F. Bender and F. W. King.
- Tech. Note 2 High Temperature Kiln-Drying of Eastern Canadian Softwoods. J. L. Ladell.
- Tech. Note 3 Strength and Related Properties of Woods Grown in Canada.
- Tech. Note 4 Dielectric Properties of Resin Glues for Wood. T. J. S. Cole and O. S. Roscoe.
- Tech. Note 5 Effect of Tree Size of Spruce and Balsam Fir on Harvesting and Conversion to Lumber in Nova Scotia. J. A. Doyle.
- Tech. Note 6 Wood Residues as Pulp Material and Development in Wallboard Production. J. A. Doyle and F. Bender (for 7th B.C.F.C. in Australia and New Zealand).
- Tech. Note 7 A Pulp Chip Program to Utilize Sawmill Residue. G. E. Bell.
- Tech. Note 8 Short-Log Bolters—Their Use in the Conversion of Canadian Hardwoods. W. W. Calvert.

Technical Reports

- Sawmill Residue in the Prince George Area of British Columbia. C. F. McBride.
- Red Heart Stain of Lodgepole Pine Logs in the Northern Interior of B.C. H. W. Eades and J. W. Roff.
- Sawing Hardwood for Grade with Short-Log Bolters. G. E. Bell and W. W. Calvert.
- Curved Plywood—Its Production and Application in the Furniture Industry. D. G. Miller.
- Traitement des poteaux de clôture faits d'essences peu durables, au moyen de préservatifs en milieu aqueux par la méthode de l'imprégnation de la base. J. Krzyzewski.
- Préservatifs du bois et leur application.
- Program of Work, F.P.L. of C., 1957-58.
- Semi-Annual Report of F.P.L. of C.
- 1957 List of Publications of F.P.L. of C.

Reprints of Articles and Papers

- F.P.L.'s War Against Wood Waste. J. H. Jenkins. *Canada Lumberman*. Microbiological Utilization of Cellulose and Wood. D. W. Stranks. Reprinted from *Canadian Journal of Microbiology*, February 1956.
- Progress in the Utilization of Sawmill Waste for Pulpwood. J. H. Jenkins. Reprinted from *Pulp and Paper Magazine of Canada*, April 1956.
- Some Variables Affecting the Shrinkage of Western Hemlock. W. C. Fountain and F. W. Guernsey. Reprinted from *Forest Products Journal*, April 1956.
- Thickness and Density of Bark—Trends of Variation for Six Pulpwood Species. J. D. Hale. Reprinted from *Pulp and Paper Magazine of Canada*, December 1955.
- Variation Throughout the Year in Moisture Content of Some Wooden Building Components. E. Brooks. Reprinted from *Timber of Canada*, April 1956.
- Analytical Method for Thujaplicins. H. MacLean and J. A. F. Gardner. Reprinted from *Analytical Chemistry*, April 1956.
- White Elm Veneer and Plywood. A. O. Feihl. Reprinted from *Timber of Canada*, September 1956.
- The Efficiency of Scarf Joints. A. P. Jessome. Reprinted from *Canadian Woodworker*, June 1956.
- Forest Products Laboratories of Canada. Reprinted from *Canadian Woodworker*, October 1956.
- Report of a Visit to Russia's Forest Industries. J. H. Jenkins. Reprinted from *Canada Lumberman*, November 1956.
- High-temperature Drying of Yellow Birch. J. L. Ladell. Reprinted from *Forest Products Journal*, November 1956.
- Cutting White Spruce Veneers for Plywood. A. O. Feihl. Reprinted from *Canadian Woodworker*, November 1956.
- Worm Holes in Jack Pine. D. E. Kennedy. Reprinted from *Timber of Canada*, January 1957.
- Adjustable Sawmilling Gauge. G. W. Andrews. January 1957.
- Logging Waste Survey in Alberta. G. R. W. Nixon and R. W. Kennedy. Reprinted from *Prairie Lumberman*, November 1956.
- Distribution of Fungicidal Extractives in Western Red Cedar Heartwood. H. MacLean and J. A. F. Gardner. Reprinted from *Forest Products Journal*, December 1956.

Magazine Articles Additional to Those Listed Under Reprints

- Effect of Tree Size on Harvesting and Conversion. J. A. Doyle. *Timber of Canada*, May 1957.
- Canada Conducts Board Research. J. H. Jenkins. *The Lumberman*, May 1957.
- Russia's Forest Industries. J. H. Jenkins. *Southern Lumberman*, May 1957, and *Northeastern Logger*, August 1957.
- Wood Utilization Practices and Trends. G. E. Bell. *Forestry Chronicle*, June 1957.
- Sawmill Research at the Ottawa Laboratory of the F.P.L. of Canada. J. H. Jenkins. *Northeastern Logger*, August 1957.
- Wooden Containers and Pallets. J. M. Rudnicki. *Timber Technology*, August 1957.
- A Comparison of the Heartwood Extractives of *Picea Glauca* and *Picea Engelmanni*. G. M. Barton and J. A. F. Gardner. *Forestry Chronicle*, June 1957.
- What's Ahead for the Lumber Industry (Symposium). J. H. Jenkins. *Timber of Canada*, September 1957.
- The Manufacture of Fibreboard—The Effect of Physical Form of Raw Material. F. W. King and H. Schwartz, *Timber Technology*, September and October 1957.
- Log Grading Rules. W. W. Calvert, *Timber Trade Journal*, September 1957.
- Dielectric Properties of Resin Glues for Wood—D. G. Miller and T. J. S. Cole, *Forest Products Journal*, October 1957.
- Economics of Barking and Chip Production. G. E. Bell. *Unasylva*, Vol. 11, 1957.
- Where Can You Sell Sawmill Chips. J. A. Doyle. *Canada Lumberman*, December 1957.

- The Efficiency of Scarf Joints. A. P. Jessome. Wood (London) November 1957.
 High Temperature Kiln-Drying of Eastern Canadian Softwoods. Wood (London) October and November 1957.
 How to Take Pre-treatment Laboratory Stock. P. L. Northcott. Canada Lumberman, October 1957.
 Deterioration of Dihydroquercetin in Douglas Fir and Western Larch Wood. G. M. Barton and J. A. F. Gardner. Analytical Chemistry 30, 1958.
 Skidding Time Studies in the B.C. Southern Interior. D. C. Gunn and F. W. Guernsey. British Columbia Lumberman, February 1958.

Natural History Branch of the National Museum

Publications

- The Canadian Caribou Research Program. By A. W. F. Banfield, Arctic Circular, 10: 17-20. 1957 (1958).
 A Snapping Turtle, *Chelydra serpentina serpentina* containing eighty-three eggs. Sherman Bleakney. Copeia, 1957: 143.
 Two Erythristic *Plethodon cinereus* from Nova Scotia. By Sherman Bleakney, Copeia, 1957: 143.
 The Egg-laying Habits of the Salamander, *Ambystoma jeffersonianum*. Sherman Bleakney. Copeia, 1957: 141-142.
 Additional Records of the Four-toed Salamander, *Hemidactylum acutatum*, from Nova Scotia. Sherman Bleakney. Copeia, 1957: 142-143.
 The Significance of Turtle Bones from Archæological Sites in Southern Ontario and Quebec. Sherman Bleakney. Canadian Field-Naturalist, 72: 1-4. 1958.
 Notes on the Amphipod Genus *Orchestoidea* on the Pacific Coast of North America. E. L. Bousfield. Bulletin of the Southern California Academy of Science, 56: 119-130. 1957.
 Ecological Investigations on Shore Invertebrates of the Pacific Coast of Canada, 1955. E. L. Bousfield, Bulletin of the National Museum of Canada, 147: 104-115. 1957.
 Canadian Mammals. A. W. Cameron, National Museum Pamphlet, 81 pages. 1958.
 Some Additions to the California Moss Flora. H. A. Crum. Madroño, 14: 74-79. 1957.
 A Contribution to the Moss Flora of Ecuador. H. A. Crum. Svensk Botanist Tidskrift, 51: 197-206, 1957.
 Bryophytes from Guadalupe Island, Baja California. H. A. Crum and H. A. Miller. Southwest Naturalist, 1: 116-120. 1957.
 The Machris Brazilian Expedition, Botany: Musci. H. A. Crum. Los Angeles County Museum. Contributions in Science, 18: 3-8. 1957.
 The Mosses of Porto Rico and the Virgin Islands. H. A. Crum and W. C. Steere. The New York Academy of Science, Scientific Survey of Porto Rico and the Virgin Islands, 7: 395-599. 1957.
 Warblers in the Prairie Provinces. W. E. Godfrey. Warblers of America. 325-331. Devin-Adair Co., New York, 1957.
 Birds of Cape Breton Island, Nova Scotia. W. E. Godfrey. Canadian Field-Naturalist, 72: 7-27. 1958.
 Quelques oiseaux du Canada. W. E. Godfrey. National Museum Pamphlet, 48 pages. 1957.
 The Comparative Number of Species of Amphibians in Canada and Other Countries. S. W. Gorham. Canadian Field-Naturalist, 71: 182-191. 1957.
 Folk Names of Canadian Birds. W. L. McAtee. Bulletin of the National Museum of Canada, 149: 74 pages. 1957.
 Illustrated Flora of the Canadian Arctic Archipelago. A. E. Porsild. Bulletin of the National Museum of Canada, 146: 209 pages. 1957.
 Tertiary Plains of Alberta and Saskatchewan. L. S. Russell. Proceedings of the Geological Association of Canada, 9: 17-19. 1957.
 Mollusca from the Tertiary of Princeton, British Columbia. L. S. Russell. Bulletin of the National Museum of Canada, 147: 84-95. 1958.

- Paleocene Mammal Teeth from Alberta. L. S. Russell. Bulletin of the National Museum of Canada, 147: 96-103. 1958.
- An Annotated List of the Marine Algae of British Columbia and Northern Washington. R. F. Scagel. Bulletin of the National Museum of Canada, 150: 289 pages. 1957 (1958).
- Flora of Manitoba. H. J. Scoggan. Bulletin of the National Museum of Canada, 140: 619 pages. 1957 (1958).

Human History Branch of the National Museum

Publications

- The United Church Site near Rock Lake in Manitoba. *Anthropologica* 6:119-153, 1958 (in collaboration with R. S. MacNeish). K. H. Capes.
- The First Manitoulinites. On Scenic Highway 68. Through Manitoulin. Chamber of Commerce, Little Current. Thomas E. Lee.
- The Antiquity of the Sheguiandah Site. *Canadian Field-Naturalist*, Vol. 71, No. 3. Ottawa. Reviewed in *New World Antiquity*, Vol. 5, No. 2, London, England. Thomas E. Lee.
- Northern Survey. *Ontario History*, Vol. L, No. 1. Toronto. Thomas E. Lee.
- Appendix to the Boys and Barrie Sites, by F. Ridley, Toronto. The Ontario Archaeological Society, Publication No. 4. Thomas E. Lee.
- Cucurbit Materials from Three Caves near Ocampo, Tamaulipas. *American Antiquity*, Vol. 22, No. 4, April 1957. Richard S. MacNeish, Thomas W. Whitaker, and Hugh Cutler.
- The Independent Investigator, in *The Identification of Non-artifactual Archaeological Materials*. Edited by Walter W. Taylor, National Research Council, Publication 565, Washington, D.C. 1957. R. S. MacNeish.
- Archaeological Activities in Canada 1955-56. Instituto Panamericano de Geografía e Historia, Vol. 19, 1957, Mexico. R. S. MacNeish.
- Archaeological Investigations in the Arctic and sub-Arctic, 1957. *Arctic*, Vol. 10, No. 3. R. S. MacNeish.
- Mackenzie River Mysteries. *Professional Public Service Magazine*, Vol. 36, No. 2, 1957. R. S. MacNeish.
- Review of *The Archaeology of New Jersey—the Abbott Farm*, by D. Cross. *American Antiquity*, Vol. 23, No. 4, March 1958. R. S. MacNeish.
- The United Church Site near Rock Lake in Manitoba. (In collaboration with K. H. Capes.) *Anthropologica* 6:119-153. 1958. R. S. MacNeish.
- Review of "Ancient Man in North America, by H. M. Wormington". *Anthropologica* 6:158-160. 1958. R. S. MacNeish.
- Review of "Haida Carvers in Argillite by Marius Barbeau". *Anthropologica* 6:161. 1958. H. S. Pfeiffer.
- Belle-Anse. National Museum of Canada, 1957. Marcel Rioux.
- Rapport préliminaire de l'étude sur la culture acadienne du Nouveau-Brunswick. National Museum, 1957, pp. 62-64. Marcel Rioux.
- Relativisme culturel et jugement de valeur. *Anthropologica* 6:61-67. 1957. Marcel Rioux.
- Remarques sur les concepts de folk-société paysanne. *Anthropologica* 5:147-162. 1957. Marcel Rioux.
- Les Indiens, in "Les genres de vie polaire". La documentation photographique, No. 172 (Le dossier du mois, février 1957). Édition de la présidence du conseil, Paris. (En collaboration.) Photo commentée. Jacques Rousseau.
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Appendix H

Annual Report of the Commissioner of the Northwest Territories—1957–58

Commissioner—GORDON ROBERTSON

Council

The Council met twice, once at Frobisher Bay from June 3rd to 7th, 1957, and once at Yellowknife from January 14th to 21st, 1958. The session at Frobisher Bay was the first ever held in the Eastern Arctic, an indication of the increasing significance of this community and the Arctic Islands. A highlight of the session was the presentation of a formal address by the Commissioner to the Eskimo people and the reply of their representative, Simonee. For the members of the Council visiting the Eastern Arctic for the first time, this ceremony and the dance that followed provided an impressive introduction to the people of the area.

The session in Yellowknife was the first since the Territorial elections in August, 1957. The only new elected member was K. H. Lang from the constituency of Mackenzie Delta. Among the appointed members, H. M. Jones, Director of the Indian Affairs Branch of the Department of Citizenship and Immigration, replaced Mr. Boucher. W. G. Brown, the new Deputy Commissioner, was appointed to replace Mr. Cunningham in April, 1957. Mr. Brown sat as a member of the Council for the first time at the June session in Frobisher Bay.

At both sessions there were several topics of importance discussed during the debates on the Commissioner's opening address. In Frobisher Bay these included health insurance, radio facilities in the north, and the welfare and education of the Eskimo people. At Yellowknife they included liquor at Aklavik, the caribou situation, beaver hunting in the Mackenzie Beaver Sanctuary, the proposed changes in the mining regulations, the improvement of transportation facilities, and the hostel system of education. In Yellowknife, the Council also passed motions of sympathy for the families of C. H. Herbert and W. Nason. The vacancy of Legal Adviser was filled by the appointment of E. R. Olson.

Altogether, there were seventeen bills passed by the Council. Among the most important were the following: an amendment to the Old Age Assistance and Blind Persons Allowance Ordinance, raising the maximum monthly payment to recipients to \$55; an amendment to the Game Ordinance to further restrict the taking of caribou, and, subject to the regulations, the killing of polar bear, and to regulate the use of caribou meat and the sale of buffalo meat; and an amendment to the Fuel Oil Tax Ordinance to extend its application to the Keewatin and Franklin Districts. Four other important pieces of legislation were the new Financial Agreement Ordinance, empowering the Commissioner to enter into a financial agreement with the Federal Government for the five-year period 1957–58 to 1961–62; an amendment to the Fur Export Tax Ordinance, reducing the royalty on muskrat, marten, and weasel; an amendment to the Insurance Ordinance; and an amendment to the Workmen's Compensation Ordinance, to provide for cases where workmen to whom compensation is payable leave Canada, and to enable the Referee to order the occupational re-training of disabled workmen. There were also amendments to the Business Licence Ordinance and the Liquor Ordinance.

Economic Activity

Economic activity declined slightly during the year, thereby reflecting the somewhat slower pace of expansion in the national economy as a whole. Government construction programs in the settlements and municipalities in the Mackenzie District were accelerated however, and the construction of housing along the Distant Early Warning Line helped sustain a fairly buoyant level of activity in these regions. The reduced caribou herds and the decline in fur trapping served to emphasize the difficulty

of many persons continuing to rely on a hunting and trapping way of life. Each year makes it more apparent that the basic problem is the provision of permanent employment—and of the training that is required for such employment—as the long term solution to the situation of the people.

The decline in the production of minerals is a direct reflection of the prevailing market conditions. Exploration for copper and nickel continued in the Coppermine River area where diamond drilling was carried on to investigate showings of these minerals. In that area, lying south and east of Great Slave Lake, there was a new discovery of lead-zinc-copper, which occurred in a fractured sandstone. Toward the end of the year there was a trend away from base metals to exploration activity for gold.

The greatest amount of staking of mineral claims occurred in the Arctic and Hudson Bay Mining District, where 5,600 mineral claims were recorded. The areas were quite widespread, ranging from the islands along the east coast of Hudson Bay to southern Baffin Island, and inland from Eskimo Point on the west coast of Hudson Bay. Diamond drilling was continued on the Belcher Islands and on some mineral claims inland from the west coast of Hudson Bay.

The occurrence of nickel at Rankin Inlet was developed to production, and high-grade nickel ore is being concentrated. The large percentage of Eskimos employed at the mine will assist in the development of a stable economy for them and at the same time reduce labour turnover for the mining company.

The preliminary figures for the value of mineral production in 1957, including pitchblende, totalled \$21,965,933, as against \$22,157,935 in 1956. Gold production in 1957 decreased to \$11,360,702, from a total of \$12,149,447 in 1956, and pitchblende declined to \$8,925,000, compared with \$9,176,076 in 1956. The production of silver, crude oil, and natural gas also declined slightly.

The number of quartz claims recorded in the Northwest Territories during 1957 totalled 7,849.

Exploration for oil and gas in the Northwest Territories continued in the area lying west of Hay River, where one major oil exploration company drilled structure test holes, stratigraphic test holes, and a few wildcat wells.

Seismic crews were active in four separate areas, and toward the end of the season, major oil activity began in the Mackenzie Delta area and gave every indication of continuing into the following year at a very high level.

As of March 31, 1958, 403 permits covering a total area of 21,439,160 acres were in good standing in the Northwest Territories. Since the 23rd of September the issue of permits under the Territorial Oil and Gas Regulations has been suspended pending revision of these regulations, and at March 31, 1958, applications for 325 permits covering an area of 13,757,645 acres were being held in abeyance.

The Great Slave Lake fishery yielded 6,140,778 pounds of whitefish and lake trout during the summer of 1957 (June to September) and the winter of 1957-58 (December 1957 to March 1958). This was a decrease of 457,005 pounds from the 1956-57 catch and is well below the quota of nine million pounds.

The fur trapping industry in the Territories, after showing a considerable increase in 1954-55, declined in the crop year 1955-56 and again in 1956-57. In 1956-57 a total of 256,887 pelts with an estimated value of \$732,000 were exported, compared with 366,000 pelts with an estimated value of \$806,000 for 1955-56. Generally speaking, the fur market continued in a depressed condition, although there was improvement in prices for white fox and lynx at the beginning of the year. Lynx prices held up quite well, but white fox fell off slightly. The decrease in number of pelts and estimated value was due mainly to a decrease of about 100,000 in muskrat production.

Workmen's Compensation

Greater efforts were made to ensure that small businesses and non-resident contractors complied with the provisions of the Ordinance, and the measures taken in this regard were most successful. In 1957 there were 271 insured employers as compared to 255 in 1956.

The reduction in assessment rates effective January 1, 1957, coupled with a decrease in DEW Line construction activity, brought assessment collections more closely into line with actual costs. Collections amounted to \$20,069 compared with \$51,917 in

1956-57. Administrative costs amounted to \$15,585 (excluding arrears in Referee's fees for 1954-55 and 1956) as against \$7,037 the previous year. The increased costs are largely attributable to Referee's fees amounting to \$3,500 not paid in 1956-57 and to the increase from 25 per cent to 40 per cent of the office operating costs charged to the workmen's compensation account.

Comparative figures for the last two years are as follows:

	1956	1957
Non-compensable accidents	824	670
Compensable accidents	626	454
Compensation payments	\$266,435 28	\$319,138 60
Medical and hospital payments	\$121,152 59	\$126,975 95

Health

The Public Health Ordinance passed at the January 1957 Session of the Council was proclaimed on the 1st of September, 1957. New regulations dealing with communicable diseases, sanitation in camps, general sanitation, and sanitation in eating and drinking places came into effect on the same day.

On the 1st of April, 1957, the Territorial Government began sharing the cost of operating Northern Health Services facilities in the Northwest Territories with the Department of National Health and Welfare. Shareable costs relate to all health centres, nursing stations, and treatment units in the Territories, and include salaries of professional and other staff, operation and maintenance, and medicine and supplies. The Territorial Government's share is based on the non-Indian and non-Eskimo population in the area served, less fee revenue received from such people for services rendered.

The effects of the extensive tuberculosis prevention and treatment program of the Territorial Government, which has been spectacularly successful during the past few years, appear to have levelled off with a slight increase in the total number of patient days from 12,404 in 1956 to 13,023 in 1957. On the other hand, the total number of tuberculosis patient days for Indian and Eskimo patients who are residents of the Territories and the responsibility of the Federal Government, dropped from 279,000 patient days in 1956 to 245,000 patient days in 1957, a decrease of nearly 12 per cent.

A new nursing station at Hay River, known as the H. H. Williams Memorial Hospital, owned and operated by the Pentecostal Assemblies of Canada, was completed and officially opened. The establishment of this station, constructed with financial assistance from the federal, territorial, and municipal governments, together with the establishment for the first time of a private medical practitioner at this point, has resulted in a great improvement in the medical and hospital services available to the residents of the area.

Under the National Health Grants Program, public health training was provided for three graduate nurses, who will be employed in the Territories following completion of their course. A total of seven nurses have received public health training from the Territorial Governments in recent years. Salk vaccine was made available to all persons in the Territories under 20 years of age, and the tuberculosis case-finding survey was again carried out in the summer months. In Yellowknife free dental services were provided for children under 16 years of age. In conjunction with the Alberta Co-ordinating Council for Crippled Children, the treatment and rehabilitation of crippled children was continued. Financial assistance was also continued to the nursing aid school in Fort Smith and to the research program for the study of parasitic diseases in northern Canada. Twenty residents received free cancer diagnosis and treatment.

A significant development was the establishment of a Permanent Advisory Committee on Northern Health. This committee consists of representatives from Indian and Northern Health Services of the Department of National Health and Welfare and from the Territorial Government. The committee meets monthly, and its purpose is to keep health matters in northern Canada under constant review.

Welfare

Relief assistance was provided for indigents as required. There was a small increase in the number of recipients of old age assistance, blind persons allowance, and disabled persons allowance, but it would appear that the number of recipients has reached a level where there will not be an appreciable increase in the future.

At March 31, 1958, there were 103 recipients of old age assistance compared to 102 at the same time in the previous year. Seventy of these were Treaty Indians, 22 were Eskimos, and 11 were other than Indian and Eskimo. There were 27 recipients of blind persons allowance compared to 25 last year. Of these, 10 were Indian, and 15 were Eskimo. Nine applications for disabled persons allowance were received, making a total of 16 since the program came into operation. Six have been approved, of which 3 are Eskimo, 2 Indian, and 1 White. Four applications have been rejected on medical grounds, 2 were eligible for old age assistance, and 4 are being processed.

The most significant development relates to the increase in the maximum monthly pension from \$40 to \$55. At the June 1957 Session of the Council, amendments to the Ordinances authorized a maximum increase of \$6 a month to recipients, effective July 1, 1957. A further amendment to the Ordinance at the January 1958 Session of the Council authorized an additional maximum increase of \$9 a month from November 1, 1957. Both increases were in keeping with amendments to the Federal Acts authorizing a higher Federal contribution. Corresponding increases in the maximum permissible income limits were approved at the same time.

A trained social worker was hired by the Municipal District of Yellowknife in January 1958. The Territorial Government contributed 60 per cent of the worker's salary and paid 50 per cent of the cost of purchasing an automobile.

Education

Day Schools were operated throughout the Territories by the Department of Northern Affairs and National Resources, with the Territorial Government reimbursing the Federal Government on a per pupil cost basis for non-Indian and non-Eskimo children in attendance.

A new 200-pupil hostel and 14-classroom school opened in Fort Smith on January 2, 1958. This is the first of a new Federal-Territorial financed school and hostel projects to come into operation, and the formal opening ceremonies held on January 13th were attended by the Commissioner and Council. It is anticipated that the new combined high and vocational school, and the 100-student hostel, at Yellowknife, will open in September 1958, as will the new 100-student hostel at Fort McPherson. Construction of the 25-classroom school at Inuvik (formerly Aklavik East 3) and two 250-pupil hostels also at that point is well under way, and they are expected to be in use in the autumn of 1959.

Residential schools were operated by the Anglican Church at Aklavik and by the Roman Catholic Church at Fort Resolution, Fort Providence, and Aklavik. The Fort Resolution school was closed concurrently with the opening of the new school and hostel at Fort Smith.

At Port Radium, Consolidated Discovery Mine, Rayrock Mine, and Norman Wells, schools were operated jointly by the interested mining companies and the Territorial Government. The companies provided classroom and living accommodation for the teachers. The Territorial Government was responsible for school supplies and for the salaries and allowances of the teachers.

Yellowknife Public School District No. 1 continued to operate a 15-classroom elementary and high school, and Yellowknife Separate School District No. 2 continued to operate a 6-classroom school in which instruction was provided to Grade XI. These are the only organized school districts in the Territories. Territorial financial assistance toward the operation of these schools was raised from \$150 to \$175 per pupil in Grades I to VI and from \$225 to \$250 per pupil in Grades VII to XII.

School enrolment at March 31, 1958, compared with June 30, 1957, was as follows:

	Indians		Eskimos		Others		Total	
	1957	1958	1957	1958	1957	1958	1957	1958
Federal Day Schools.....	393	431	303	360	493	726	1,189	1,517
Hostels ¹ (Gov't.).....	120	145	107	109	55	52	282	306
Mission and Mission Residential Schools.....	266	318	150	154	242	116	658	588
Mine Schools ²	0	2	0	60	27	35	27	97
Hospital Schools.....	86	95	26	30	4	10	116	135
Yellowknife Public School	1	2	0	0	225	301	226	303
Yellowknife Separate School	12	15	0	0	110	126	122	141
TOTAL.....	878	1,008	586	713	1,156	1,366	2,620	3,087

¹ Fort Smith, Fort McPherson, Chesterfield Inlet, Coppermine.

² Includes Mine School operated at Rankin Nickel Mines in 1957-58. This will become a Federal Day School commencing in 1958-59.

The Territorial Government again provided a scholarship of \$1,200 to the student obtaining the highest marks in the final Grade XII examinations. The scholarship continues in like amounts for four years, subject to satisfactory progress being made by the student. Under the plan three students are at present attending the University of Alberta.

Progress was made in devising a special curriculum for schools in the Territories. Studies respecting curriculum needs are being made by committees of teachers and others, with a view to preparing courses of study specially designed to meet the needs of the Territories.

Shipments of films on a monthly basis to settlements in the Mackenzie District and special shipments of films to other settlements in the Territories were made. School programs were featured over Mackenzie District radio stations.

The Vocational Training program, designed to prepare trainees for gainful employment, was further expanded. Ninety-eight non-Eskimo and non-Indian persons either completed their training or continued training through local training programs, apprenticeship training, on-the-job training, and training in Technical Institutes. Several received their training outside the Territories at such centres as Edmonton, Calgary, and Winnipeg.

Game

The caribou population continued at a low level, and, to aid in the conservation of this species, funds for wolf control were again increased. A total of 825 wolves were taken during 1956-57. Statistics covering the 1957-58 operations were not available when this report was prepared, but preliminary reports indicate the kill will be up.

Statistics indicating a decline in the fur trapping industry are set out in the section of this report headed "Economic Activity".

Municipal Affairs

At its June session, the Council approved an upward revision in the rates of the general grants payable to Municipal Districts. It also introduced a new grant to help meet the cost of road maintenance within municipalities.

The general grant was increased from 7 mills on the first million dollars of the assessed value of real property on which taxes are payable and 4 mills on the assessed

value of such property in excess of one million dollars to 10 mills and 8 mills, respectively. In addition, the assessment base for this grant was enlarged by including in the calculation the assessed value of federal and territorial property within the subdivided area of a municipality.

The new road maintenance grant is an amount equivalent to 25 per cent of approved expenditures by the municipality on road maintenance.

The former grants equivalent to 50 per cent of the cost of approved road construction and 80 per cent of the cost of indigent care are to be continued.

Construction continued at Inuvik under the supervision of the Federal Department of Public Works. The new community was declared a Development Area, and Site Control Regulations were established. Negotiations continued with property holders at the old site regarding compensation and the allocation of property at the new site. Limited private construction commenced at the new site.

The Local Improvement District of Fort Smith was also declared a Development Area, and a Development Plan prepared by the Central Mortgage and Housing Corporation and Territorial Officials was approved by the local residents at a public meeting. Subsequently, to bring the plan into being, Development Regulations were established. Consulting engineers were engaged to advise on revisions to the water system, and the design of a sewage system and a new 200-lot residential subdivision was surveyed. With the assistance from the local ratepayers, experimental insect control was carried out jointly by the Federal and Territorial Governments.

In the Local Improvement District of Fort Simpson, routine road construction and maintenance were carried out, and a volunteer fire brigade was organized by the District. A water tank truck with pump was given to the community, and various other pieces of equipment were purchased jointly by the Territorial Government and the ratepayers of the District.

Finances

The completion of a new agreement with the Federal Government for the 5-year period 1957-58 to 1961-62 was authorized during the year. Under the terms of this new agreement there will be a substantial increase in the annual payment to the Territories by the Federal Government. The payment for the last year of the old agreement (1956-57) amounted to \$365,770, and the payment for the first year of the new agreement was \$565,450. Subsequent payments will fluctuate in accordance with changes in the gross national product per capita.

Territorial revenues and expenditures in 1957-58 as compared with 1956-57 were as follows:

	1956-57	1957-58
Revenue	\$ 1,893,933	\$ 2,131,066
Expenditure	1,797,890	2,654,792
Surplus	\$ 96,043	
Deficit		\$ 523,726

At the close of the year, cash in the Northwest Territories Revenue Account amounted to \$690,493, as compared with \$1,214,219 at March 31, 1957. Of this amount, \$107,427 is being held as a reserve for Workmen's Compensation. The financial statements considered by the Council in January, in conjunction with the main appropriations for 1958-59, forecast a deficit of \$841,201 in that year's operations, and it is, therefore, apparent that the Territorial Government will have to borrow a substantial sum to meet its 1958-59 commitments.

Appendix I

Annual Report of the Commissioner of the Yukon Territory—1957-58

Commissioner—F. H. COLLINS

Legislation

Two Council sessions were held during the past year at which the following Ordinances were passed:

First Session, March 20th to April 5th, 1957

- An Ordinance to Regulate the Speed and Operation of Motor Vehicles on Highways.
- An Ordinance to Amend the Contributory Negligence Ordinance.
- An Ordinance to Amend the Insurance Ordinance.
- An Ordinance to Authorize the Commissioner to Sell Certain Property in the City of Whitehorse.
- An Ordinance to Amend the Public Service Ordinance.
- An Ordinance to Amend the Business Licence Ordinance.
- An Ordinance to Amend the Poll Tax Ordinance.
- An Ordinance for Granting to The Commissioner Certain Sums of Money to Defray Expenses of the Public Service of the Territory for the Fiscal Year Ending March 31st, 1957.
- An Ordinance For Granting to the Commissioner Certain Sums of Money to Defray Expenses of the Public Service of the Territory for the Fiscal Year Ending March 31st, 1958.

Second Session, November 6th to November 16th, 1957

- An Ordinance Respecting Liens in Favour of Miners.
- An Ordinance to Provide for Annual Vacations With Pay for Employees.
- An Ordinance to Regulate Certain Matters Relating to Labour.
- An Ordinance Respecting the Floral Emblem of Yukon Territory.
- An Ordinance to Provide for the Orderly Development of Unorganized Areas.
- An Ordinance Respecting Controverted Elections.
- An Ordinance Respecting the Election of Members to the Council of the Yukon Territory.
- An Ordinance to Authorize the Commissioner of the Yukon Territory to Enter into an Agreement with the Minister of Citizenship and Immigration of Canada Respecting the Education of Indian Children in the City of Whitehorse.
- An Ordinance Respecting a Financial Agreement Between the Yukon Territory and the Government of Canada.
- An Ordinance to Amend the Old Age Assistance and Blind Persons Allowance Ordinance.
- An Ordinance to Amend the Disabled Persons Allowance Ordinance.
- An Ordinance to Amend the Motor Vehicles Ordinance.
- An Ordinance to Amend the Hospital Aid Ordinance.
- An Ordinance to Amend the Municipal Ordinance.

The following elected members were in attendance: A. R. Hayes, Carmacks (Carmacks District), Speaker; V. C. Mellor, Dawson (Dawson District); J. L. Phelps, Whitehorse (Whitehorse East); R. Hulland, Whitehorse, (Whitehorse West); D. C. McGeachy, Mayo, (Mayo District).

The appointed officers were H. J. Taylor, Clerk of the Council, and F. G. Smith, Legal Adviser.

Territorial Secretary's Department

The number of persons receiving Old Age Assistance (65 to 69 age group) has again been considerably increased over the previous years, as follows: 1956, 20; 1957, 31; 1958, 41.

The number of persons receiving Blind Persons Allowance has been reduced to five, one having been transferred to the Federal Old Age Security pension rolls.

There were no claims for Disabled Persons Allowances.

The births, marriages and deaths recorded during 1957-58 and 1956-57 were as follows:

<i>Births</i>		<i>Marriages</i>		<i>Deaths</i>	
1957	1958	1957	1958	1957	1958
466	495	119	110	93	94

Of the 10,705 licences issued under the Motor Vehicles Ordinance, 2,683 were for private automobiles, 1,406 for trucks, and 40 for taxis. There were 3,832 driver's licences and 1,910 chauffeur's licences issued. In most categories, there was an increase of approximately 10 per cent over the previous year.

There were 329 business licences issued, of which 66 were for taxi operators, 46 for filling stations and garage keepers, 35 for general merchants, 31 for restaurants, 28 for hotels and rooming houses, 27 for contractors and 14 for insurance agents.

The total tax assessment was \$2,450,039 for an increase of \$119,420 over the previous year.

The Territory was without the services of a Boiler Inspector during the past year. However, a Boiler Inspector has been engaged for this coming summer and a complete inspection of all boilers will be made throughout the Territory.

There were 10 local companies incorporated and 31 companies whose head offices are outside the Territory licensed and registered under the Companies Ordinance. Four societies were incorporated under the Societies Ordinance. At the close of the year the register contained 244 companies of which 90 were incorporated in the Territory, and 29 societies, all in good standing. Licensing and incorporation revenues for the year exceeded \$6,000.

Health and Public Welfare Services

This service comprising Maternal Health and Child Health Programs, School Health Services, Communicable Disease Program, Tuberculosis, Venereal Disease and Cancer Control, Poliomyelitis, and Health Education, formerly carried out by the Public Health Nurse under the direction of the Chief Medical Health Officer and in conjunction with the local Medical Health Officers, was taken over by Northern Health Services. The Territory bears 70 per cent of the cost and the Federal Government 30 per cent.

Grants to hospitals were as follows:

Whitehorse General Hospital	(73-bed)—\$30,186
Mayo General Hospital	(14-bed)—\$ 9,154
St. Mary's Hospital, Dawson	(45-bed)—\$20,025 10

The only other hospital functioning in the Territory at present is the Department of National Defence Hospital at Whitehorse. The new Northern Health Services Hospital is still under construction and is expected to be ready in the autumn of 1958.

Public premises are regularly inspected by the Sanitary Inspector who travelled over 19,000 miles in the Territory in the discharge of his duties. Some 1,639 inspections were made, 179 notices issued, 57 complaints investigated and 75 water samples taken.

The administrative work in relation to the Territorial Tuberculosis Control Program was carried out by the Supervisor of Welfare. Although the new Northern Health Services Scheme was put into operation on April 1, 1957, this Department continued to assume responsibility for the administration of the program in so far as territorial responsibilities were concerned.

Through the co-operation of the Indian Health Services of the Charles Camsell Hospital (Edmonton), the annual chest X-ray survey was carried out successfully.

Equipment and two technicians were supplied by the Camsell Hospital with the nurses and staff of the local Indian and Northern Health Services Branch assisting. During the survey, 4,470 persons were X-rayed.

A total of 162 X-rays, authorized by the Chief Medical Officer, were taken at Territorial hospitals, of tuberculosis suspects, contacts and as follow-ups on former sanatorium patients. An additional 1,477 had chest X-rays taken in Territorial hospitals at the direction and upon the recommendation of the local doctors.

A total of 23 active tuberculosis cases were in confinement and received treatment at various sanatoria in the western provinces, as responsibilities of the Yukon Territory. Of this number, 13 were already in hospital prior to the beginning of the fiscal year. Ten new cases were discharged, and one patient died, leaving 12 cases still under treatment in provincial sanatoria at the end of the fiscal year.

In addition, three cases of tuberculosis were treated in the local hospital and discharged after short-term confinement. Drug therapy was continued at home.

The expenditure for this service amounted to \$50,884.02.

Three aged persons were sent out to the Vancouver Cancer Clinic for specialized treatment. In one case surgery was necessary and was performed at the General Hospital, Vancouver. All three persons were recipients of Territorial social allowances, and consequently, the Territory assumed the costs of transportation, care and hospitalization. The total expenditure for cancer control in 1957-58 was \$665.88.

Seven persons were adjudged insane by the Magistrate's Court and were committed by Order of the Commissioner to the Mental Hospital at Essondale, British Columbia. Of this number, five persons were residents of the Yukon, but two had not gained Yukon residence at the time of their committal and, consequently, the Territory did not assume financial responsibility for them. The cost to the Territory for this service amounted to \$62,892.77.

Social assistance cases for which the Territory assumed responsibility numbered 172. Of this number 34 were family units and 138 were individuals who had gained Yukon residence.

Social allowances were issued to 72 persons during the year. These allowances are paid for the most part to senior citizens whose sole income is the Federal Old Age Security or the Territorial Old Age Assistance pension.

Subsistence allowances were granted to 34 families and 25 individuals of indigent status. These allowances are authorized in all cases where it is felt that the indigent person is not capable of assuming responsibility for the proper expenditure of a social allowance by cheque, or where it is indicated that this type of assistance is the best method of supplying the necessary material aid. Assistance is in kind, consisting of food, fuel, rent, and other supplies necessary for normal existence.

Other types of social assistance granted during the year included professional and special services; cartage on supplies for indigent persons living at remote points; light, water and scavenger service; and clothing. The total expenditure for social assistance was \$48,457.28.

A review of the child welfare cases indicates an increase in the number of children taken into care. The number reached 55 during the peak month and stood at 30 by the end of the fiscal year. The majority of these children will be permanent wards, whose parents have died or entirely abandoned them. The Territorial Government assumes full responsibility for their welfare and planning for their future.

An agreement was negotiated with the Child Welfare Division of the British Columbia Government providing for the placement of British Columbia children in adoption homes in the Yukon Territory. This means that the British Columbia Child Welfare Division will accept applications from Yukon residents wishing to adopt children. Already, the British Columbia agency has placed five children in approved adoption homes in the Yukon. The Alberta Child Welfare Department also placed three children with adoptive parents in the Yukon.

Six adoptions were legally completed in the Territorial Court. All children had been placed during the previous year, and the adoption probation period ended in this fiscal year.

The caseworker investigated 125 cases of child neglect, an increase of 75. Family disputes totalled 48 as compared with 10 in the previous year. Unmarried

mothers given casework services totalled 15 as compared with 11 in 1956-57. Adoption home studies completed were 25. In addition, other services were given in family counselling, juvenile delinquency cases, supervision of children and foster homes.

The 1957-58 expenditure for child welfare was \$29,309.97.

Workmen's Compensation

The number of employers operating in the Territory increased slightly to 308 principally in the general construction and oil exploration fields. The number of accidents totalled 725, a slight decrease although approximately thirty-four were referred to the Referee for adjudication.

The net assessment was \$15,532.81. Expenditures were \$14,185.19 plus \$6,100 representing Referee's fees for 1954-56 inclusive.

Seven hundred and twenty-five accidents were reported: 522 non-compensable; 191 temporary disability; 11 permanent disability; and one fatality. Medical expenses totalled \$67,357.97 and compensation payments \$105,139.45.

Education

Education in the Territory is administered by the Superintendent of Education. There are 16 schools in operation, employing 69 full-time and two part-time teachers. Total enrolment at September 1, 1957 was 1,790. There have been no major changes in senior staff teaching positions since 1956—probably the result of a revised salary schedule and promotion policy.

The old school at Dawson burned on the night of June 21st, 1957, fortunately with no casualties. Immediate steps were taken to initiate planning and construction of a new school to be built in 1958-59. Plans were also made for the construction of a new 8-room elementary school in Riverdale sub-division at Whitehorse; 2-room schools and teachers' living quarters at Elsa and at Haines Junction and an addition to the school at Watson Lake "Y".

Plans to establish a vocational training school in Whitehorse within the next year or two are under consideration and it is probable that an Assistant Superintendent of Schools will be required.

Game Department

Poison bait stations set out by aircraft numbered 49 and 18 others were placed by the Director of Game and forestry wardens. In addition, seven big game guides were authorized to establish bait stations in their areas. Results are expected to be better than last year when one wolf was killed for every bait set out. This year all baits were carefully set out and marked rather than being dropped in the snow.

Reports on the elk and bison imported some years ago indicate that a number of elk have survived and are doing well. Their range seems to hinge on the northern end of Fox Lake on the Whitehorse-Keno Road.

In July, 1957, a buffalo bull and evidence of cows and calves were seen near the confluence of the White and Donjek Rivers, west central Yukon. A single, young bull has been seen around Haines Junction.

There have been reports of cougars in the Yukon and one hunter claims to have killed one on the Haines Road in August, 1957.

Critical reports of hunters shooting too many caribou and abandoning the carcasses in 1956 led to the establishment of a check station at the Dawson Ferry and in tighter patrols in the hunting area. A count indicated 175 caribou taken in the Sixty Mile Road area in 1957.

There are a total of 224 individual traplines registered. A large number of traplines are not being used because of the poor fur market during recent years. Efforts are being continued to have trapline renewals kept up to date. There were 44 family registrations, a slight drop from 1955-56.

Twenty-five land patrols and twelve water patrols were made during the year in addition to the setting out of poison baits.

Game Taken—Season 1956-57

	Bear	Grizzly	Caribou	Moose	Sheep	Goat	Coyote	Wolves	Eagle
Non-Resident Hunters									
Spring Hunt..	2 Brn	2	—	—	—	—	—	—	—
Fall Hunt 1957	4 Blk	41	31	47	81	5	nil	2	1
Resident Hunters									
1956-57.....	74	26	359	158	39	8	39	34	nil
Registered Trappers									
1956-57.....	28	21	1265	177	13	1	33	52	nil
Totals.....	108	90	1655	382	133	14	72	88	1

Migratory and Upland Game Birds taken by Registered Trappers, and Non-Resident Hunters, Season 1956-57: ducks, 2,486; geese, 92; spruce grouse, 1,404; ruffed grouse, 144; Franklin grouse, 55; sharp-tail grouse, 30; blue grouse, 143; ptarmigan, 545.

Fur-bearing Animals Taken by Registered Trappers

	Season 1955-56	Season 1956-57	Increase	Decrease
Beaver.....	2,112	1,299	—	813
Fisher.....	26	7	—	19
Otter.....	43	18	—	25
Fox, Black.....	—	—	—	—
“ Cross.....	24	7	—	17
“ Red.....	73	43	—	30
“ Silver.....	2	8	6	—
“ White.....	—	—	—	—
Lynx.....	1,483	793	—	690
Marten.....	819	215	—	604
Mink.....	477	283	—	194
Muskrat.....	35,005	23,565	—	11,440
Weasel.....	591	609	18	—
Squirrel.....	40,633	27,207	—	13,426

Revenues collected by the Game Department totalled \$24,899.71 for the fiscal year under review.

Roads, Bridges and Public Works

The difficulties experienced during the year resulted principally from above-normal runoff in May and winter floods in December. Fortunately the winter floods occurred near the town of Mayo and it was possible to deal with the emergency without interfering with regular maintenance.

Although all the roads were affected by the May runoff, most damage occurred on the Stewart Crossing-Dawson Road and on the Mayo-Elsa Road. A great deal of effort and expenditure were required to re-open these roads. This extra work delayed planned maintenance and construction activities.

Resurfacing of the Whitehorse-Keno Road was carried out between Mile 0 and Mile 15 and Mile 200 to Mile 247.

Break-up of the Yukon, Pelly and Stewart Rivers occurred between May 10th and 16th and the extreme high water delayed the ferry launchings for about four weeks.

The ferry at the Yukon was launched on May 26th and at the Pelly and Stewart on June 6th. Minor interruptions of ferry service were experienced during the summer amounting to about 2 per cent of the operating time. The Stewart ferry was removed from service October 23rd, the Pelly on October 24th, and the Carmacks ferry on November 29th. The ice bridges were open to light traffic on December 18th, and for all traffic January 1st.

Work continued on the re-construction of the road between the Flat Creek and Dawson. The road from Dawson to the Alaska Boundary received normal maintenance during the summer months. During the winter months an ice bridge was constructed over the Yukon River at Dawson and the road was maintained as far as the Clinton Creek cut-off at Mile 35. This is the first time that this section of road has been maintained as an all-weather road since its construction.

Reconstruction of the Canol road began in July, 1957, at Johnson's Crossing and was completed to Mile 30—Sydney Creek.

A liquor store and warehouse were constructed in Mayo and a warehouse was also constructed at the Whitehorse garage. At Watson Lake a liquor store and vendor's residence were constructed. Normal maintenance and certain minor improvements were carried out on existing school buildings.

ARCTIC OCEAN

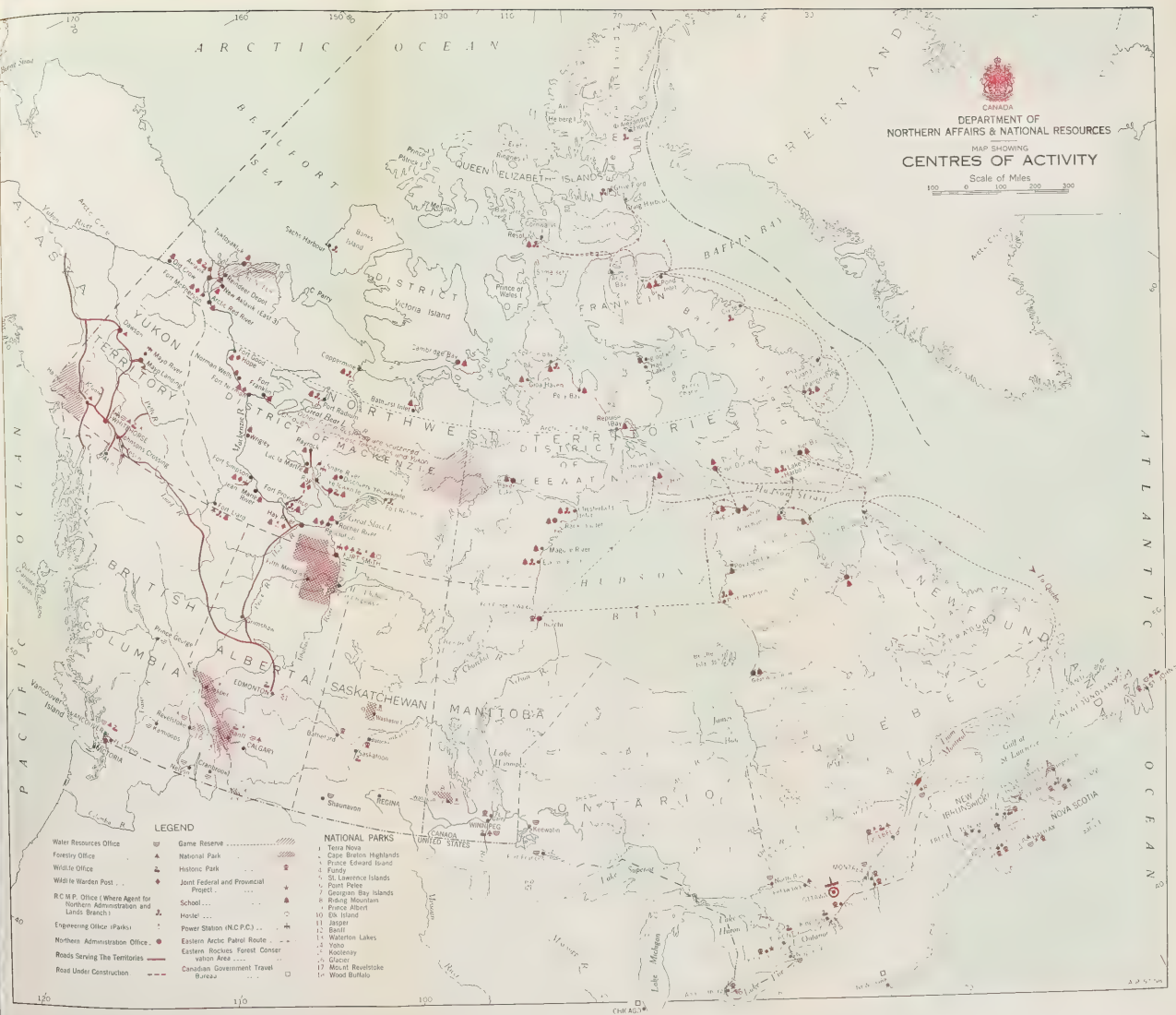


DEPARTMENT OF
NORTHERN AFFAIRS & NATIONAL RESOURCES

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FISCAL YEAR 1958-1959

Including an article
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OTTAWA, 1959

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*To His Excellency Major General Georges P. Vanier, D.S.O.,
M.C., C.D., Governor General and Commander-in-Chief of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the Annual Report of the Department of Northern Affairs and National Resources for the fiscal year ended March 31, 1959.

Respectfully submitted,

ALVIN HAMILTON
*Minister of Northern Affairs and
National Resources*

*The Honourable Alvin Hamilton, P.C., M.P.,
Minister of Northern Affairs and
National Resources*

SIR:

I have the honour to submit the Sixth Annual Report of the Department of Northern Affairs and National Resources for the fiscal year which ended March 31, 1959.

The expansion of departmental activities is reflected in expenditures which totalled \$65,176,832 in 1958-59 as compared with \$49,071,273 in the previous fiscal year. It is interesting to note that while our expenditures increased by about 32 per cent, revenues climbed 300 per cent from last year. Most of this increase in revenue is attributable to the much greater exploration activity on the part of oil and gas companies working in the North.

The results achieved by our efforts to implement your policies of national development have been gratifying during the period under review. The momentum of northern development accelerated sharply, necessitating an administrative re-organization of the Northern Administration Branch. Particular attention has been devoted to territorial development roads and the pace of their construction has been stepped up. Nine of the ten provinces have accepted your offer of federal assistance for the construction of Roads to Resources and work is already underway on agreed programs in all participating provinces. Preliminary planning has commenced for the National Conservation Conference. The effectiveness of the Forestry Branch has been greatly increased by the completion of the two new Forest Products Laboratories in Vancouver and Ottawa. Good progress has been made on Canada's newest National Park—Terra Nova in Newfoundland. Our Water Resources Branch continued to provide valuable advisory service to the Government in connection with the Columbia River and other complex problems in water use. Planning to enlarge the National Museum considerably and to institute a program to make it a more positive force in Canadian life has gone ahead, as well as the usual research work in the human and natural sciences.

The Canadian Government Travel Bureau continued its program to promote travel to Canada. The special Atlantic Provinces campaign was particularly successful and was undoubtedly a factor in the significant increase in the number of tourists visiting the area during 1958. The Bureau made good progress in the revision of all its tourist literature and adopted a new slogan for its U.S. advertising: "Canada—the wonderful world at your

doorstep". I would particularly draw to your attention a special article examining the Canadian tourist industry which appears as a preface to this Report.

National attention was attracted to the economic potential of the Northwest Territories by the eagerness of private enterprise to explore for oil and gas. Exploration permits for more than 48 million acres in the Yukon and Northwest Territories were issued and priorities for permits allotted on more than 80 million acres in the Arctic Islands. In the light of this activity and of probable developments in future years, oil and gas regulations were studied continually throughout the year. The new Territorial Oil and Gas Regulations, which came into effect in August, 1958, are intended to encourage additional exploration and development and to further safeguard the public interest. At year's end, new regulations were being prepared for the oil and gas areas lying north of 70 degrees latitude and for the lands lying under Canadian territorial waters.

In this connection, the area of Canada available for exploration and development has been significantly augmented as the result of the International Convention on the Continental Shelf adopted in April 1958 at the Geneva Conference on the Law of the Sea. This Convention gives the coastal state sovereign rights to explore and exploit the resources of the sea-bed and subsoil out to a depth of 200 metres, or beyond that depth if exploitation is economically feasible.

The major northern construction project was the extension of the Mackenzie Highway to Yellowknife. Fifty-eight miles of construction was completed bringing the road to a point 35 miles north of Fort Providence at its southerly end. About 40 per cent of the northern section from Yellowknife to Rae has been finished. Work was started on the Dawson-Eagle Plain Road in the Yukon Territory, the bridge across the Yukon at Carmacks on the Whitehorse-Dawson Road came into service, and construction of the Pelly and Stewart bridges continued. Schools, hotels, housing units, workshops, warehouses and other structures were built or improved.

As in earlier years, the Department was concerned with the problems being encountered by the Eskimo people as a result of the changing economy of the North. For those Eskimos who depend on the dwindling caribou herds and the other resources of the land, the situation is grave unless measures are taken to diversify their economy. During the year, 120 people from the interior of the Keewatin District were re-settled at Rankin Inlet on the west coast of Hudson Bay in order to protect them from the ever-present threat of starvation. Regular patrols were made to outlying camps in the Keewatin District and our ability to locate Eskimos in distress was greatly improved by the assignment of two R.C.M. Police aircraft to operate in cooperation with Northern Service Officers under an arrangement by which this department shares in their costs of operation.

To cope with the diverse and swiftly changing problems of northern administration, the Northern Administration Branch was reorganized. In

this reorganization, more administrative responsibility was delegated to the field staffs and the functions of the various divisions defined more clearly. A new division was created to foster those smaller economic developments that will bring practical and immediate benefits to the Eskimo people. This division supervised the organization of the first Eskimo co-operatives during the year.

The Sir John Franklin School at Yellowknife, together with its 100-pupil residence, Akaitcho Hall, were opened in September 1958. This composite high and vocational training school was built and is operated by the Federal Government in co-operation with the Territorial Government, which contributed toward the cost of the school. Forty-six schools were operated for 3,692 full-time and 237 part-time pupils, including 1,394 Eskimo children.

The Advisory Committee on Northern Development has met regularly throughout the year. This Interdepartmental Committee is charged with the responsibilities of advising the government on questions of policy relating to northern Canada and of providing for the effective coordination of government activities in that area. Sub-committees concerned with Construction, Transportation, Telecommunications, and Scientific Research considered more detailed matters. The Secretary of the Committee has arranged for the co-ordination of government activities in accordance with the recommendations of the Advisory Committee and its sub-committees.

In research and in administration of agreements providing assistance to the provinces, the Forestry Branch continued to make significant contributions to the knowledge of silviculture and forest management, to the provincial administration of forests and to the technology of the wood-using industries. Federal financial assistance to the provinces was provided under Canada Forestry Act agreements for inventories, reforestation, fire protection and the construction of access roads. The forestry agreements, since their inception in 1951, have provided more than \$15 million in federal funds to the provinces.

Reports of the seven provinces participating in the Federal-Provincial agreements for forest inventories were completed by March 31, 1959, and cover a national gross inventory area of 1,129,000 square miles of forest. During the fiscal year, six provinces received payments for the planting of a total of 15,548,000 trees, and nine provinces were allotted \$750,000 to assist in the extension of fire protection facilities. Agreements under which the Federal Government contributes half the cost of constructing forest access roads and trails were implemented for a second period of eight months. Federal contributions under these and the previous agreements amounted to \$2,698,333 up to the end of the fiscal year.

The Forest Products Laboratories of Canada exploited the facilities provided by its new laboratories at Ottawa and Vancouver to pursue 200 research projects. Research in timber physics achieved some important results, notably the development of a sonic device for detecting defective glue bonds in plywood.

Visitors to the National Parks totalled more than four million. The road reconstruction program continued to improve travel facilities within the parks. The winter works program undertaken by the National Parks Branch provided 6,415 man-months of employment. Steady employment for 1,500 men was provided between January and March.

In addition to the development of Terra Nova National Park, major projects undertaken by the National Parks Branch included the construction of a promenade between Dufferin Terrace and the Plains of Abraham at Quebec City, and completion of the restoration of Fort Langley under an agreement with the Government of British Columbia. The 18th century building at 17 St. Louis Street, Quebec City, was acquired as a national historic site and its restoration started. Seven historic sites were marked.

The Canadian Government Travel Bureau reports that travel expenditures in Canada by visitors from the United States and other countries in 1958 was \$352 million, about \$10 million less than in 1957. An increase in interprovincial travel by Canadians helped offset this decrease in U.S. tourist traffic. More than 28 million people come to Canada each year for holidays, and this flow of tourist traffic can be increased, with beneficial results to the economy. Of significance to the tourist industry was the Government's announcement that federal aid would be available to the provinces for the construction of campsites and picnic grounds along the route of the Trans-Canada Highway. The details of this program were decided in consultation with representatives of the provinces at the Federal-Provincial Tourist Conference in December 1958, and the Federal Government agreed to meet one-half of the estimated \$4 million cost of providing these facilities.

While the Trans-Canada campground and picnic area program was a new undertaking, the winter work program of the previous year was repeated. Under these arrangements federal assistance was available to the provinces for the construction of campgrounds and picnic areas anywhere within a province. More than 4,000 man-months of winter employment were provided by the projects undertaken under these agreements. Since this work began, 500 picnic areas and campgrounds have been started and \$3.5 million provided as the Federal Government's share of this work.

The Water Resources Branch continued its studies and recording of Canada's water power resources. Field operations of the hydrometric survey, which is a major part of the branch's program, involved 7,206 stream discharge measurements and 2,097 inspections at the 1,268 gauging stations maintained all across Canada. Almost 2½ million horsepower of new hydro-electric capacity was added during the year bringing the total installed turbine capacity to 22 million horsepower.

This review is intended to summarize briefly the activities of the Department during the fiscal year. I trust that you will be able to discern in these bare facts some notable accomplishments achieved through the efforts of a capable and loyal staff. I also wish to acknowledge the outstanding spirit

of co-operation displayed by other departments of government and the various provincial, territorial and municipal agencies with which we have dealt. Their assistance and advice has been appreciated deeply. In particular, I should like to express appreciation for the services rendered to our Department by the Translation Office and the Office of the Chief Treasury Officer.

Your obedient servant,

R. G. ROBERTSON,

Deputy Minister

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Inserted at the back of this Report is a map showing the location of national and historic parks; game reserves; highway projects; forestry, water resources, wildlife, engineering and Northern Administration offices and posts, and other centres of departmental activity.

Department of Northern Affairs and National Resources*

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 Special Assistant R. A. FAIBISH

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 Assistant Director (Administration) F. A. G. CARTER
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 National Historic Sites Division *Chief*—J. D. HERBERT
 Engineering Services Division *Chief*—G. L. SCOTT
 Canadian Wildlife Service *Chief*—W. W. MAIR

Water Resources Branch

Director T. M. PATTERSON
 Operations Division *Chief Engineer*—J. D. MCLEOD
 Hydraulics Division *Chief Hydraulic Engineer*—R. H. CLARK

* as of December 1st, 1959.

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Forest Research Division	<i>Chief</i> —D. R. REDMOND
Forestry Operations Division	<i>Chief</i> —H. W. BEALL
Forest Products Laboratories Division	<i>Chief</i> —J. H. JENKINS

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Botany	A. E. PORSILD
Geology	J. F. HENDERSON (Hon. Curator)
Mineralogy	S. C. ROBINSON (Hon. Curator)
Palaeontology (Vertebrate)	W. LANGSTON JR.
(Invertebrate)	H. W. FREBOLD (Hon. Curator)
Zoology	A. W. F. BANFIELD

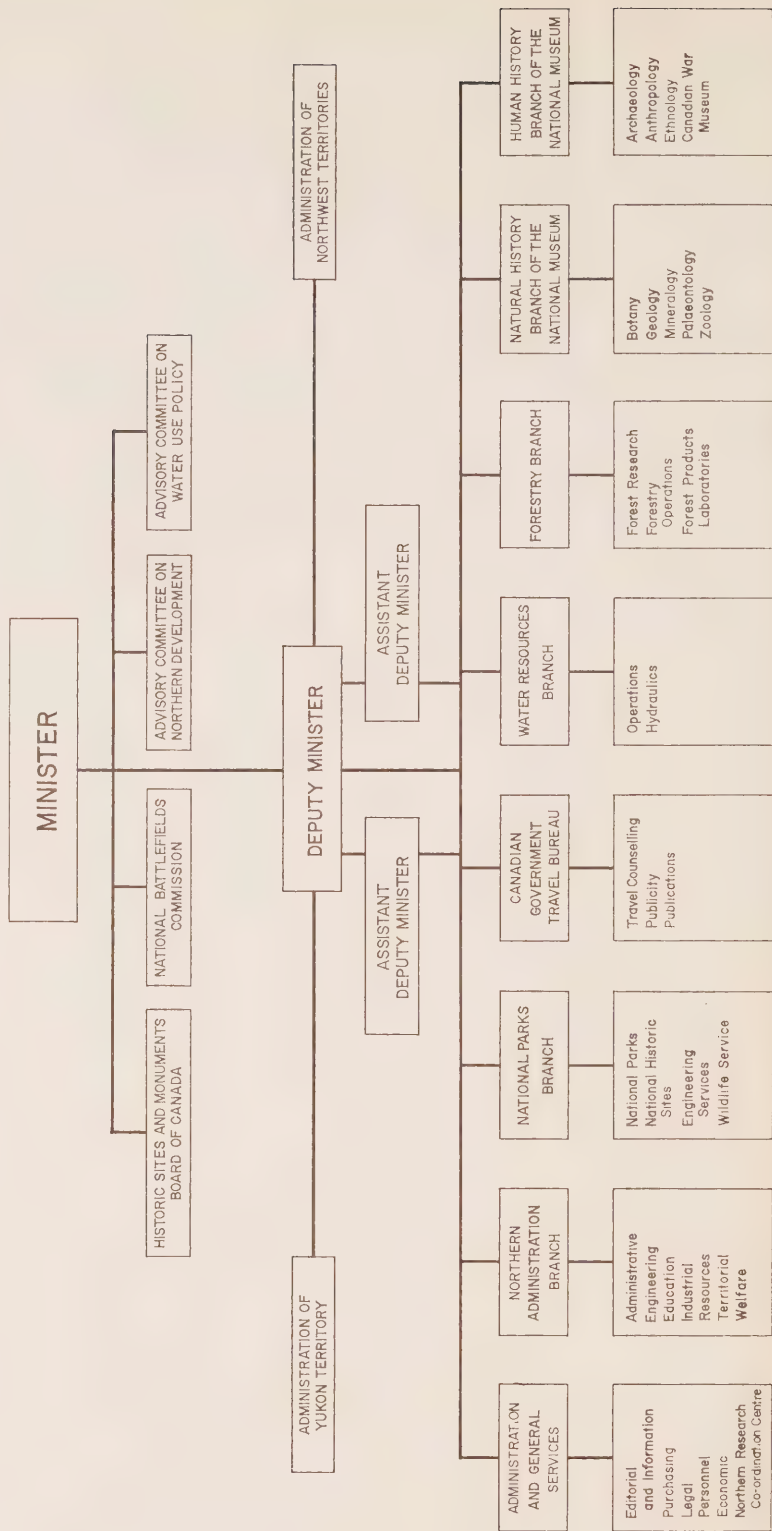
National Museum of Canada—**Human History Branch**

Acting Director	L. S. RUSSELL
Archaeology	R. S. MACNEISH
Anthropology	T. F. S. McFEAT
Folklore	CARMEN ROY
Canadian War Museum	L. F. MURRAY

Canadian Government Travel Bureau

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Travel Information and Publications	R. DOUGLAS PALMER
Publicity	R. DEGROSBOIS
Research	H. CROMBIE
Films and Television	F. GALIPEAU
Administration	H. LYLE KOHLER

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES





Everybody's Business — Travel in Canada

The desire to travel stems from the very first man who roamed the earth in search of food and shelter, and to satisfy an insatiable curiosity about his environment.

Through the centuries this deep-rooted restlessness was a driving force behind the great explorers and adventurers. It opened new lands for settlement, created vast empires, and increased our knowledge in every field of endeavour. As civilization progressed, new reasons for travel developed. There was travel for commerce, for religion, for education and for health. There was travel for pleasure, too, but it was almost exclusively reserved for the wealthy. Even then, only the hardy few dared to take journeys of any length. Transportation was slow, uncomfortable and costly, and trips were oftentimes dangerous.

During the twentieth century, this picture has been changed by new developments in transportation, accommodation, and services, and by the increase in personal incomes and leisure time. Travel for pleasure is now available to almost all North Americans. Interest in visiting distant places has grown as the opportunities have increased and today masses of people travel everywhere on a scale never before known.

In economic terms, recreational travel has become one of Canada's major industries. It is our third ranking source of export income, surpassed only by newsprint and wheat. It has grown to such an extent over the past two decades that the standard of living of every Canadian is affected to some extent by the progress it makes each year.

But to see tourism only in economic terms is to miss its wider significance. Experience of other regions has important effects on the growth of national consciousness in Canada, and impressions gained at first-hand in other countries can contribute to wider international understanding. Visiting gives, both to the guest and to the host, deeper insights into a world where all peoples are neighbours.

Most Canadians are frequently tourists themselves, and expect and appreciate good facilities and a hospitable welcome in the regions they visit. In return all share the obligations of the good host.

Tourist Fundamentals

Our reputation among our visitors depends on human satisfaction of the most personal kind. It thrives on the application of good public relations



principles, on the revival of interest in such things as conservation, Canadian history and the preservation of historic sites, on community beautification, and on maintenance of our national characteristics. Service and courtesy are always essential. Good food, transportation facilities, comfortable accommodation and entertainment are its foundations, and each fundamental is dependent upon all the others. The most magnificent scenery, the most attractive facilities, the best high-

ways and the most varied programs of entertainment will fail if they are not coupled with considerate attention and service to the individual visitor.

Statistics show that Canada's receipts on international travel account have not kept pace with the total rate of increase on world expenditures for travel. Have we neglected some of the fundamentals expected of hosts? This question surely deserves some thought by each one of us. Americans, for instance, have confined the greater part of their increased travel to their own country and to countries overseas. Even among Canadian travellers themselves, other countries figure prominently in vacation plans, as indeed they should. Too much reliance may have been placed on the acknowledged attractiveness of our scenery, our resources of fish and game, our accessible wilderness areas.

What does the tourist expect when he visits Canada? No matter what country he comes from, he wants a change first of all, he wants to see new scenery, exciting events and unusual attractions. Nevertheless, his basic requirements remain similar to those of Canadian travellers. He wants a clean, comfortable room and bed, he wants competent personal service, he wants good food and he looks for reasonable rates. He also expects courtesy and fair dealing. These last ingredients are perhaps the ones which most affect the prospects for his future business. Given all these he will return again and again and again. Repeat business in every field of tourist service determines the real future for Canadian travel.

Nothing will encourage the flow of travel to Canada more than a well-founded belief on the part of all tourist operators that Canadian hospitality is based on genuine good will, basic friendship and honesty to the visitor. Each year it is demonstrated many times that courtesy and honesty are the most appreciated items on the tourist bill-of-fare. The warm, friendly attitude which is so characteristic of most Canadians is a far greater asset than the knowledge that tourism is a paying commercial proposition. It is the attitude of the Canadian whom the tourist and his family meet which shapes his opinion of our country. A single unfortunate incident can give rise to a feeling of antagonism which will make the rounds of his friends and neighbours when he returns home. Studies made by the Travel Bureau over the years indicate that more than 40 per cent of the Americans coming to Canada did so on the advice of friends. We should encourage publicity like this. Should we fail in any essential of hospitality, the tourist will not spread the word of welcome. Accuracy and truth are essential. False or misleading information disappoints visitors, and leads to losses to resort owners and ill will toward the whole nation.

Some Statistics

The structure of the Canadian tourist industry can most easily be outlined in economic terms. Unfortunately, reliable statistics on recreational travel in Canada by Canadians are not available, but the figures on visitors from other countries alone are sufficient to indicate the importance of the industry to each one of us.

The greatest percentage of tourists visiting Canada come from the United States whose citizens each year cross the border in increasing numbers. Using the "long-stay" automobile entry figures plus those by plane, train, bus and boat, issued by the Dominion Bureau of Statistics, it is estimated that well over 7,000,000 United States visitors annually spend all or part of their vacations in Canada. In 1958, they left \$309 million in this country. Visitors from countries other than the United States spend \$43 million on vacationing in Canada.

Producers and distributors throughout Canada all share, directly or indirectly, in the earnings of the travel industry. The typical dollar spent by a tourist in Canada is first distributed as follows: between 31 and 32 cents are spent on food and beverages; over 23 cents for lodging and 16 cents for transportation; seven cents are spent on handicrafts and souvenirs and 12 cents for other merchandise; and about 10 cents for other miscellaneous items. This income is then redistributed through all channels of



commerce and taxation in the country. Gasoline taxes paid by visiting motorists, for instance, help build more and better highways, while income from fish and game licences does its share in conserving those resources.

Tourism is Everyone's Concern

The job of entertaining the thousands of visitors who yearly stream across the international border and provincial boundaries therefore rests not only with those actively engaged in the tourist industry like hotel owners, tourist camp operators, and restaurant proprietors, but with all Canadians in every community. The people who visit us will go home with impressions not only of our hotels and our scenery, but also of the individual people they meet. They will remember, too, the facilities provided for our own people, which the tourist shares while he is here.

How can the ordinary Canadian citizen assist the development of the tourist industry? There are several ways. One of them is to further the growth of a distinctive Canadian cuisine, and to encourage the improvement of existing standards of catering in the hotels and restaurants serving our tourists.

We have neglected many of our culinary opportunities. There are not nearly enough regional dishes. There is not nearly enough use of good, local foods. They do not have to be fancy. The operative word is "good". Even the provinces bordering the oceans are apt to overlook the wealth of seafood available for their menus. We can do a great deal of valuable work in encouraging improvement in regional menus, and in supporting the use of special seasonal dishes on the tourist menus. However, above all, the cooking and ingredients must be good. An artificially contrived and second rate dish—however "distinctive" or by whatever "Canadian" name it may be called—is not enough. To-day's tourist gets good food at home—and good food on the road in his own country. He won't come back if he doesn't get it in Canada.

There is a tendency, too, to overlook the importance of Canada's historic past. History has a strong appeal for the visitor as well as contributing to a consciousness of our national identity. We can and should visit our historic places and direct visitors to them. The success of places like Fort Henry at Kingston where red-coated, university students depict the drills and manoeuvres of British forces of another century, the pageantry of history developed so successfully in British Columbia during its centennial celebrations, in the Yukon gold-rush diamond jubilee and the bi-centennial in Louisbourg, Nova Scotia, are only a few illustrations of how effective this kind of attraction can be in bringing visitors. Events like these recall images of our history, with which many tourist guests are often unfamiliar. Great pageants and festivals could become the feature projects of any group striving to help its community.

Of vital importance to the country as a whole, and to tourism in particular, is the conservation of our forests, waters and wildlife. The distinctively Canadian attractions of great wilderness areas, studded with lakes

and streams, and filled with animal and bird life, offer a travel bargain with which few other forms of outdoor recreation can compete on even terms. Improvements to existing highways, new road construction, high automobile ownership and the popularity of outboard motors have led to increased pressure on hunting and fishing throughout Canada. There is an ever-rising demand for recreational development of wilderness areas which can now be reached conveniently.

Thousands of Canadians engaged in serving the wants and needs of tourists owe their very livelihood to the fact that vast sections of Canada are still relatively untouched by civilization. But it has also been most important that provisions were made to set aside choice recreational areas before pressure from industrialization and population growth wiped them out. A direct result was the creation of the national and provincial parks systems which preserved some of the country's most beautiful regions, embracing a wide variety of scenery. They are maintained for the use and enjoyment of the people of Canada and other visitors, and many of them are absolute sanctuaries where it is hoped to maintain the forests and wild-life in perpetuity.

The national and provincial parks not only attract the tourist from beyond Canada's borders, but have played a large part in the decided increase in inter-provincial travel during recent years. There is no doubt that Canada's travel industry owes a great deal to the wise conservation and development measures taken in past years, which led to the establishment of fish and wildlife, and forestry branches of federal and provincial governments and the creation of preserves throughout the nation.

The tourist operators who profited from these conservation moves and the tourist who enjoyed their benefits have in their own turn done much to further the cause of conservation throughout Canada. Their efforts have ranged from joint movements through local groups of tourist operators and sportsmen, to representation at the national level by the Canadian Tourist Association, provincial government tourist branches, the transportation companies and the Canadian Government Travel Bureau.

Increasing demands for recreational areas create new problems for conservation. Conservation is important for tourism, but it is even more important for Canada's future. Every Canadian should concern himself



with the rational use of Canada's forests, lakes and wildlife. These are precious resources that, wisely used and husbanded, constitute a vital asset for the health and enjoyment of future generations.

Whether it be in food, courtesy, promotion of historic places, supporting community beautification or conservation programs, there are many ways in which all of us may encourage the further growth of tourism in the future. Activities like these pay added dividends in making our country pleasanter, not only for tourists, but also for all Canadians.

Changing Trends, New Challenges

The tourist pattern for North America has been changing over the past decade. With higher disposable incomes and regular holidays with pay, an annual vacation away from home has become the rule for most North Americans rather than the prerogative only of the well-to-do. Widespread automobile ownership and tremendous public investment in highways have brought most of the continent within reach of the temporary wanderer, and offer endless opportunities for him to plan a trip to suit his inclination and his purse.

With these basic changes in wealth and mobility have come new interests and new activities which were of little importance a few years ago. The popularity of skiing is an example; from a cult for a few specialists before the war, this sport has come to support growing installations in both Eastern and Western Canada. Other examples are the new popularity of camping holidays and, most recently, the growth of boating by sail or power on the lakes and canals of central Canada and on the coasts. New developments like these offer both an opportunity to the industry and a challenge which must be met if it is to compete effectively with facilities offered in other countries.

New ideas to encourage increased overseas travel have created new problems for Canada. An example is the "travel on credit" programs which have opened the door to overseas vacations to a vast new group of people once economically compelled to vacation within the limits of cash-and-carry budgets. Not only have the new concepts increased competition but they have brought about a decided change in promotion and advertising themes. No longer is it advisable, for instance, for a country to compare its beauties with those of Switzerland or France when these places with all their distinctive appeal are within easy travel time for first hand inspection. The emphasis must be towards unique, unusual, and distinctive national attractions.

Tourist operators in this country will undoubtedly keep in mind that the attraction which Canada has for visitors from other countries depends to a very great extent on their rate structure and on the value they give for money. This is particularly important at times when the exchange rate makes Canadian prices higher in terms of foreign currency.

It is true that Canada, with its winter temperatures, is an expensive country in which to build the kind of accommodation tourist guests have

come to expect. It is also true that in some seasons of the year food costs are higher than in the United States. Yet it remains a fact that Canada and the United States are competing for very much the same kind of traveller, and he and his wife are more discriminating than ever before.

In the past we have been inclined to think in terms of the usual short intensive peak of recreational travel in Canada. July and August are by far the heaviest tourist months and most of our developments are set up for the summer season. This points to one of the greatest problems in providing for recreational travel: how are we going to be able to improve and extend facilities in Canada if these have to stand idle for at least eight months of the year?

Part of the answer lies in developing tourism all the year round. By deft promotion and advertising, a few sections of this country have capitalized already on the charm of all four of Canada's seasonal periods.



Although spring, autumn and winter have yet to attract visitors in the same numbers as flock to Canada in summer, the winter season has become very important in the Laurentians and other parts of Quebec, and in some parts of Ontario, Alberta and British Columbia. To the popularity of skiing, which yearly entices thousands of devotees to mountain slopes in both eastern and western parts of Canada, have been added an increasing number of events such as winter carnivals, ice-fishing and other special attractions. Coupled with new, comfortable accommodation and fast, inexpensive transportation, the winter tourist trade has been booming in these regions. There is no reason why other sections of Canada, with equal physical attractions, could not enjoy the same benefits.

Not nearly enough effort has been made to increase tourist activity in the spring and autumn periods. There are events such as tulip festivals and blossom festivals during the spring, and colour cavalcades and grape and apple festivals during the autumn season but there is still much that can be done. There are too few colourful festivals and events in Canada's travel year. They have proved their worth over the years, and there is every reason to believe that development of special events year-round would help reduce "off seasons" in Canada's tourist centres.

There will also be opportunities to develop the attractions of parts of Canada now too rarely visited, even by Canadians from other regions. Tourists looking for new experiences will follow the new roads in the Northwest Territories and Yukon as they do now in better-known areas of the country. Statehood for Alaska has itself increased the interest of Americans in our Northwest, and the Alaska highway, connecting the new State with the road system to the south, will see increased tourist traffic. In another part of the north, buffalo hunting for sport will be available in 1959 for

the first time in more than sixty years. If its tourist resources are developed with care and imagination, the north can expect over the next decade to play host to an increasing number of tourist visitors.

Organized Promotion Services

To make known Canadian tourist attractions and facilities, the Federal Government and all ten provincial governments support active travel bureaus. Transportation companies and other interests including regional and local organizations are also actively engaged in bringing their facilities to the attention of tourists. With the expansion of pleasure travel and the resulting competition has come wide use of marketing surveys and other research techniques. Valuable as these tools of analysis are, those who are concerned with travellers must not lose sight of the fact that they are dealing with people, rather than statistics.



Like everyone else, each tourist has his own special desires and tastes. Some find retreat from the fast moving city life in the quiet wilderness of Canada's mountains and forests. Others prefer the luxurious comfort of hotels or the gracious relaxation to be found in lavish tourist resorts. Whatever his tastes may be, service to the individual traveller begins long before he and his family ever start their journey. He may have become interested in a Canadian vacation in any number of ways, but interest is not enough. He wants the clear, honest answers to many questions before he makes the final decisions about his holiday.

He is concerned with what a vacation will cost him in relation to what he will get for his money. He wants to know such things as the exact price of accommodation; if it includes a single or double room, a bathroom with shower or bath; if it has electric lights and indoor plumbing; if it is heated or winterized. He is also interested in where he will eat on his vacation; if there is a central dining hall, a restaurant or snack bar; if there is a clean, modern kitchen and well prepared food; if fresh local produce will be served and what it will cost him for a full course meal.

Important to the vacationer are the recreational facilities; is there good hunting and fishing, are boats, equipment and guides available and what will be the cost? Are golf, tennis, swimming, riding, and other forms of recreation to be found? He may also want to know about routes, road conditions, and transportation schedules, about the best week for the autumn colour, or about skiing conditions in March.

In the field of travel promotion the Canadian Government Travel Bureau discharges the federal responsibility for "selling" Canadian vacation opportunities to the people of the United States and other countries. Its methods combine advertising and publicity in a host of media together with a direct mail and free travel counselling service that operates on a very large

scale. The natural basis for all its advertising and promotion has always been an essentially human appeal. How successful it has been is illustrated by the tremendous response. During 1958, for instance, some 750,000 requests for travel information were handled by the Bureau's offices in Ottawa, New York and Chicago.

The Canadian transportation companies as well as the provincial governments carry on extensive promotion and advertising activities both inside Canada and in the United States. The major responsibility for promoting more travel by Canadians in Canada has been borne by these agencies. To increase traffic from abroad the Canadian railways and airlines maintain offices in leading cities in the United States and Europe, as well as in Latin America. The Provincial Governments of Nova Scotia and Quebec have year-round offices in New York City. British Columbia and Alberta share a representative office in San Francisco.

What does the Future Promise?

If we make intelligent and imaginative use of our opportunities, Canada has a bright future as a vacation land. Increased leisure, improved transportation, and growth of disposable income, which have made possible dramatic developments since the war, seem certain to continue and to offer even greater opportunities. Travel times have recently been cut by the new jet services, and it is reasonably sure that both times and costs will shrink even further. The mere fact of population growth in the United States and in overseas countries will be a significant factor. Perhaps most important of all, more and more people in all parts of the world are interested in seeing strange countries and visiting new places.

The United States Department of Commerce estimates that Americans are currently spending up to \$20 billion on foreign and domestic travel. Most of our visitors for the future will continue to come from below the border, but visits from overseas should also increase with growing incomes and the removal of restrictions on travel allowances. Already British tourists intending to come to Canada are permitted an increased amount of travel dollars; prepayment of accommodation and other expenses may shortly be allowed also. Because of immigration since the war, a surprising number of people in countries like Holland and Italy have relatives living in Canada. Many of them intend to pay extended visits to this country in the next few years. The habit of travel is growing everywhere.

The challenge to Canadians is to capitalize in a constructive way on these opportunities. The search for new methods and ideas in promotion and service must continue. The typical tourist now is not the typical tourist of twenty years ago; the facilities offered and promotion used must reflect his changing and expanding needs. By these means Canada, as a vacation land, will increase its importance and prestige not only in other countries but among travel-loving Canadians themselves.

Most of us in Canada have not been sufficiently conscious of regions of our country other than our own. With the completion of the Trans-Canada Highway, it should now be easier to learn more about other parts of this country. Mass "interprovincial visits" can help to build a better nation. By getting to know more of our fellow Canadians, we will learn of the great material resources of our land and spiritual endowments of our people. This understanding will be a source of satisfaction to all Canadians who acquire it, and a source of gratification when we are all able to share it with our neighbours.

We Canadians are eager to visit the great and powerful nation to the south of us, and our less familiar neighbours overseas. We should now increase our efforts to encourage their citizens to "return our calls". We should do all we can to have them learn about our way of life in the world we share with them. The benefits derived in this way, though intangible, are at least as precious as the dollars earned. Warm northern hospitality awaits them all.

Annual Report of the Department of Northern Affairs and National Resources

Although the Department of Northern Affairs and National Resources has operated under this name only since 1953, it is actually a very old department. Under various other identities, it has been associated with national development almost since Confederation. It is a development department—charged with fostering growth and progress in the northern territories and with assisting, by various means, the orderly and wise use of certain national resources.

Eight branches form the Department.

The Northern Administration Branch bears heavy responsibilities for the economic and social development of the Yukon and Northwest Territories and for the welfare of the Eskimo people.

The National Parks Branch is the administrator of Canada's National Parks and National Historic Sites and Parks, conserving for future generations the richness of Canada's past and the wonders of its natural beauty. The Canadian Wildlife Service, forming part of this Branch, is the federal agency responsible for national wildlife conservation and research.

In the resources field are the Water Resources Branch and the Forestry Branch. The Water Resources Branch collects and evaluates basic information on Canada's water-power resources and studies broad questions of water use policy.

The Forestry Branch engages in forest and forest products research and administers various agreements with the provinces made under the Canada Forestry Act.

The Natural History and Human History Branches form the National Museum of Canada which is engaged in scientific research in natural history, archaeology, and anthropology.

The Canadian Government Travel Bureau works in many ways to increase the tourist traffic, its major effort being the vigorous promotion of Canadian tourist attractions in the United States.

To serve these various operating Branches are the administrative divisions—Economic, Editorial and Information, Legal, Personnel, and Purchasing—which, under general direction from the Chief Administrative Officer, comprise Administration Services.

In addition to the regular Branches, there are established certain Boards, Commissions and Advisory Committees which report to the Minister. These include the Historic Sites and Monuments Board of Canada, the National Battlefields Commission, the Advisory Committee on Northern Development and the Advisory Committee on Water Use Policy.

The Deputy Minister also holds the office of Commissioner of the Northwest Territories and is Chairman of the Northern Canada Power Commission.

Northern Administration Branch

The administrative responsibilities of this Branch cover a third of Canada, an area where something less than 32,000 people live.

These responsibilities, which include Eskimo affairs, the administration of the natural resources of both the Northwest and Yukon Territories and certain Crown lands and mineral rights in the provinces, are distributed among the eight major administrative units in the Branch.

The rapid pace of northern development as reflected in the growth of the Branch made desirable a complete re-organization of the Branch early in 1959. The re-organization was designed to meet changing conditions in the north and through its emphasis on decentralization it gave much more administrative responsibility to the field.

As a result of the re-organization, one Division—Arctic—disappeared and in its place two new Divisions, Industrial and Welfare, were created. The Industrial Division is newest in concept. Its responsibilities cover the whole north and include such matters as industrial liaison, community and area planning, market research, the development of co-operatives and the encouragement of handicraft production. The Welfare Division is responsible for welfare services in the Northwest Territories and amongst Eskimos wherever they live. The administration of mineral and other resources are dealt with through the Resources Division; supervision and extension of educational facilities come under the Education Division. The Engineering Division is responsible for all departmental construction and maintenance in the northern territories.

The administrative work of the Northwest Territories Government is carried on by the Territorial Division; there is no territorial civil service. This division also administers Wood Buffalo Park which lies across the Northwest Territories—Alberta boundary. A new office, Administrator of the Arctic, handles all field matters in the Eastern Arctic. Its counterpart, the Administrator of the Mackenzie, performs a similar function in the District of the Mackenzie.

The Yukon Territory is administered by a territorial civil service under the Commissioner. Advice on federal activities and their co-ordination, including general supervision of Government affairs in the Territory, is provided by the Territorial Division.

Education Division

The education of children in the Northwest Territories is a joint responsibility: the Federal Government is responsible for the educating of Indians and Eskimos; the Territorial Government is responsible for educating the other children.

The average school attendance of non-native children is much higher than that of Eskimos or Indians because most of the former have a permanent home in a community with a school while attendance of many Eskimo and Indian children is determined by movement of the game which often takes them several hundred miles from any school. As a result the enrolment of all native children is only 52 per cent.

With improved medical and social measures, the Eskimo and Indian population is increasing. Shrinking wildlife populations and poor prices for many furs have resulted in more Eskimos and Indians turning to wage employment. To compete in this new field, they need both primary and vocational education. It is the Department's aim to provide elementary education, and advanced academic or vocational education for students and adults with special aptitudes. This program is being developed by the construction of new government schools and students' residences, by providing more bursaries and other aids for students, by development of special curricula for northern schools and by conducting special vocational education projects.

The Department operated 46 schools, 19 of them in the Arctic. The Department also assisted mission schools by providing grants, supplies and teachers. Schools operated throughout the year were attended by 3,692 pupils, an increase of 620 over the previous year. Largely as a result of this, the part-time schools showed a decrease in attendance from 500 to 237. There were 1,394 Eskimo children who received schooling on either a full-time or part-time basis.

At Fort McPherson and Yellowknife, 100-pupil residences were opened in September. The Sir John Franklin School at Yellowknife opened in conjunction with the opening of the residence. This is a composite vocational training and high school built and operated by the Federal Government in co-operation with the Government of the Northwest Territories.

Arrangements were continued for the maintenance of Eskimo and Indian children in the Anglican and Roman Catholic residential schools at Aklavik and for Indian children in the Roman Catholic residential school at Fort Providence. Fourteen part-time schools were conducted by missionaries of the Roman Catholic and Anglican Mission organizations in settlements in the Northwest Territories and Northern Quebec.

In the District of Mackenzie, 38 schools were in operation with a total enrolment of 2,904 pupils. Of these 1,522 pupils were of white status, 948 were Indian and 434 were Eskimo. Seasonal schools for Indians were conducted at Nahanni Butte, Snowdrift and Trout Rock.

In the District of Keewatin, eight schools were in operation, three of which were part-time schools. In the District of Franklin, 14 schools were operated, eight of which were conducted on a part-time basis. Along the coast of northern Quebec, where Eskimos live, eight schools were in operation, three of which were on a part-time basis.

In the field of vocational training, 298 persons benefited from training on-the-job, apprenticeship training and attending courses in technical institutes. Some 23 vocational fields were covered to take advantage of employment opportunities created by the northern construction program. Greater emphasis was placed on local training programs in building construction, carpentry, electricity and plumbing. These programs were carried out at Aklavik, Yellowknife, Fort Smith, Fort Wrigley, Jean Marie River and Inuvik in the Mackenzie District and at Baker Lake in Keewatin District.

The Leduc Training Program for Eskimos in operation and maintenance of heavy equipment was transferred to Yellowknife in July.

Engineering Division

Mackenzie District, N.W.T.

The largest single project was the continuation of work on the extension of the Mackenzie Highway from Enterprise to Yellowknife. About 58 miles of road construction was completed, bringing the road to about 35 miles north of Fort Providence from the southerly end. This represents completion of about 40 per cent of the Yellowknife to Rae section. About \$3 million was spent on this project.

There was also a considerable program of minor road construction in Wood Buffalo Park, amounting to \$450,000, some of which was carried out as part of the winter works program. Other roads throughout the District were surveyed, cleared and rough graded at a cost of \$350,000.

Construction and improvements to buildings in this District amounted to \$6.2 million. Major work was the construction of the school and hostel programs, which saw the start of the Fort Simpson project, the continuation of the Inuvik project and the completion of the Fort McPherson and Yellowknife projects. Other construction included water systems, several departmental housing units, small schools, garage workshops, warehouses and various other structures.

Districts of Keewatin and Franklin, N.W.T., Northern Quebec and Churchill

Construction costs in these areas amounted to \$3.8 million with the greatest activity centred at Frobisher Bay where the program included a four-classroom school, a small office building, 25 housing units, six warehouses, and other works. At Cambridge Bay the school and residential facilities were extended and a number of housing units were erected for Eskimo employees on the DEW Line.

Yukon Territory

Construction in the Yukon cost some \$2.2 million on roads and bridges, and about \$120,000 on buildings. Work was started on the Dawson-Eagle Plain Road, and the reconstruction of the Stewart Crossing-Dawson

Road was continued. Extensive work on the reconstruction of the Whitehorse-Keno Road was carried out. The largest single item was the start of construction of the steel highway bridge over the Yukon River near Carmacks. Two departmental houses and other minor works were constructed at various locations in the Yukon Territory.

Industrial Division

This Division is concerned with the day-to-day use of resources by small companies and individuals in the Northwest Territories, and with the planning of townsites or normal community services that will be required to meet the industrial and population expansion which will follow on large-scale resource development.

Area Economic Surveys and Community Planning

During 1958 a series of area economic surveys was initiated to determine the weaknesses in the economies of specific areas and to find ways to strengthen them. The first of these was undertaken in the Ungava Bay region of northern Quebec and, as a result, organized commercial Arctic char and cod fishing, handicrafts, blueberry picking and other industries, and a timber operation to provide lumber for new houses, are being planned for the summer of 1959.

A similar area economic survey is being planned for the summer of 1959 for the Mackenzie Delta region, where standards of living, housing and morale are exceedingly low despite a relative abundance of fish, fur and timber resources.

The Division is compiling a complete set of research information on population, resources, employment opportunities, etc. for each locality within the Northwest Territories. It is carrying out liaison with other government departments and private groups interested in expanding into northern communities, and is advising on such matters as local housing policy, the provision of local services and ways and means of re-developing existing communities.

Frobisher Development Group

The Frobisher Development Group maintained active co-ordination of all activities at Frobisher Bay, and a Regional Administrator was appointed to act as local co-ordinator for the Department. Frobisher Bay was declared a development area to facilitate the control of business and construction in the community. Commercial interest has increased considerably in response to growing population and extensive construction activity in the area. Local and long-distance commercial telephone facilities are in prospect and tourist interest has been spurred by the establishment of a sports-fishing camp 20 miles outside Frobisher.

Construction of a refuelling base and its combined living and operations buildings for the Strategic Air Command, U.S.A.F. was started in mid-summer, 1958 and continued throughout the winter. The extension of the airport runway to accommodate jet aircraft was commenced in the spring of this year. Both projects are bringing a large number of workers to Frobisher.

The Department constructed a new Administration building, a four-classroom school, warehouses and other dwellings in the vicinity of the airport, thereby moving the principal Northern Affairs' housing and administration centre from Apex Hill to the Airbase area. It is anticipated that all future departmental expansion will be in this area and that Apex Hill will continue largely as an Eskimo Rehabilitation Centre.

A townsite about half a mile to the northeast of the airport was selected for the permanent town and a team of design consultants was engaged by the Department of Public Works to plan it. This team, comprising five Canadian engineering and architectural firms, assisted by a town planner, will establish an office in Ottawa for this project.

Projects

The Department continued its administration of the reindeer industry which was initiated in 1935 on the Mackenzie Delta, as a project to provide the Eskimo with employment and a supplementary source of subsistence. At present, there is one Eskimo-managed herd numbering about 1,535 animals. The remaining reindeer, approximately 3,826 animals, constitute a main Government herd, which it is hoped to increase through selective breeding. In 1958, 342 animals from the Government herd and 111 animals from the native were slaughtered and distributed.

To curb attrition of animals from natural causes, intensified research has been conducted into predator control, parasite control and range conditions. As a considerable number of animals are lost through straying, a 28-mile fence will be built from the East Channel to the Eskimo Lakes to prevent straying to the south of the range.

A number of projects, mainly experimental, have been carried out in a continuation of research into means of expanding and diversifying the Eskimo economy.

Efforts were maintained to stimulate the production of carvings and other cottage industries such as Arctic clothing manufacture and the return to the Eskimos is now estimated to be in excess of \$130,000.

A supervised Eskimo handicraft program consisting mainly of sewing parkas and other clothing was carried out with the assistance of the staffs of the Welfare Division and the Administrator of the Arctic on the CGS *C. D. HOWE* during the Eastern Arctic patrol for the benefit of Eskimos being repatriated.

Further efforts at conversion and utilization of eiderdown were carried on in the Payne Bay and Cape Dorset areas. An experiment in commercial fishing of Arctic char at Frobisher Bay established the existence of a profitable market for this great delicacy.

A community for the re-establishment of certain Keewatin Eskimos, who faced starvation due to the decline of caribou, was established at Rankin Inlet. The Eskimos are to be provided with the means of achieving financial independence through a variety of means including hunting, handicrafts and casual labour, and of providing the children with an education.

Experiments in low-cost Eskimo housing were continued with several prototypes being built and tested with varying results at Frobisher Bay, Cape Dorset and Povungnituk.

Further experiments in the development of stoves were carried out and tests were made of stoves developed by other agencies.

Field experiments in the use of Arctic marine resources were conducted and further research undertaken to assess the potential for both domestic and commercial harvesting. This work was done in co-operation with the Department of Fisheries, the Royal Canadian Mounted Police and the Fisheries Research Board.

Experiments were carried on in the field of food processing and storage, initial work having been done on a new method of Arctic refrigeration in co-operation with the National Research Council.

Co-operatives

At the first 1959 session of the Council of the Northwest Territories, an Ordinance for Co-operative Associations was passed. Good possibilities exist for an Eskimo char fishing co-operative at Port Burwell at the eastern tip of Ungava Bay, for a sport fishing co-operative at Cape Dorset on Baffin Island, and for a second char fishing co-operative at the mouth of the George River in Ungava Bay. The incorporation of these co-operatives will mark the introduction of Canadian Eskimo people into ownership of their own complex businesses. The Division is providing assistance and organizational help to these co-operatives which will be financed under the Eskimo Loan Fund.

Industrial Promotion

While much of the Division's work is in relation to the north, part of it is related to southern Canada. Markets are found for specialty food items and handicraft products which can be and are produced in the north. Southern business and industry are encouraged, where feasible, to consider operations in northern Canada. The Division acts as a clearing house for information on advanced technology which has application in the north, information on local labour forces and other matters of vital interest to potential northern business people. In addition, it works closely with private enterprise to encourage maximum Eskimo employment.

Tourist Development

Tourist development, too, is of great potential value to the people of the north. In 1959 the Division assigned an officer to investigate the tourist possibilities of the Northwest Territories and, where feasible, to encourage the development of local tourist industries. The first two tourist camps in the eastern Arctic were planned for the summer of 1959 to cater to sport-fishermen and collectors of Eskimo art. It is expected that through sound planning and development, a substantial tourist industry will be developed in the Northwest Territories during the next few years.

Resources Division¹

During the year the name of the Division was changed from Mining and Lands to Resources Division to describe more accurately the work of the Division.

The Division administers the Crown-owned mineral rights, the forests and lands in the Yukon and Northwest Territories, and certain under-rights and surface rights vested in the Crown on lands in the provinces.

During the year a study was commenced to consider revision of the basic policies covering Crown land disposition in the north. A number of provincial Crown land disposition programs were studied and reports and recommendations on land policy and land administration were prepared.

The Territorial Oil and Gas Regulations were under continual study during the year and a major amendment was made with the introduction of the Crown Reserve principle. In the latter part of the year, new oil and gas regulations were drawn up under both the Territorial Lands Act and the Public Lands Grants Act to permit disposition of oil and gas rights under the territorial waters of Canada not under provincial jurisdiction. At the same time, the lands in the Arctic Islands were withdrawn from disposition to permit the study of any special regulations needed for this region. In the interim, priority applications for Arctic Island acreage were received and a rush to obtain such priorities took place. At the end of the fiscal year, priorities were held by 28 individuals and companies for over 80 million acres in the Arctic Islands. At the end of the year, the proposed new Canada Oil and Gas Regulations were still under active study. Although the regulations were not yet promulgated, a number of companies were planning exploration work in the Arctic Islands for the summer of 1959.

A study of the present Territorial Quartz Mining Regulations and our northern mining policy was begun. It became apparent that in order to keep pace with northern exploration and development trends, the mining legislation required a complete overhaul. Discussions were held with the industry and reports proposing changes in mining policy were prepared.

The major activity in the development of northern Canada's mineral resources was in oil and gas. During the fiscal year over 48 million acres of oil and gas land permits were issued in the Yukon and Northwest Territories.

¹See Appendix B, Nos. 1, 2, 3.

Practically the entire Mackenzie Delta was taken up and the activity spread south and east. This area has become one of the greatest oil exploration frontiers in the world.

Oil and Gas—Northwest Territories and Yukon and Federal Lands in the Provinces.

Northwest Territories and the Yukon

The outstanding events in this field were the large acreages taken under permit and the revenues derived from the permits offered for public tender. During the year a total of 954 oil and gas exploratory permits, covering an area of 43,453,609 acres, were issued in the Northwest Territories and 98 oil and gas exploratory permits, totalling 4,947,035 acres, in the Yukon Territory. This made a total of 82,913,639 acres under exploratory oil and gas permit and reservation in both territories at March 31, 1959—a much larger area than in any of the provinces. In addition, priorities for permits had been allotted on 80,450,162 acres in the Arctic Islands pending revision of the Regulations for those areas north of 70° north latitude.

Revenue derived from oil and gas lands under the administration of the Oil and Gas Section amounted to a total of \$8,383,784.14. The major part of this revenue came from permit bonus bids and permit fees on Territorial lands which amounted to \$7,805,465.25.

During the year there were 32 oil companies and individual permit holders doing geological and geophysical work in the Territories employing helicopters and fixed-wing aircraft with a total of 193 personnel. This work consisted of geological studies and seismic, gravity, aero-magnetic, and other geophysical surveys to determine the nature and depth of various strata where oil and gas might accumulate. There were nine wells drilled and one well still being drilled at the end of the fiscal year. The discovery of natural gas in northeastern British Columbia early in 1959 drew particular interest to the area just north of the 60th parallel. A large amount of geological information is now being amassed on the northern areas.

Three major formal meetings and many informal meetings were held with the oil industry during the year. All regulations were discussed with the representatives of the oil and gas industry before being submitted for approval. Studies were commenced on oil and gas regulations for those areas north of 70° N. latitude having in mind the problem of producing low-cost oil in a high-cost development area.

Oil and Gas in the Provinces

During the year there were three public competitions for the acquisition of leases of oil and gas rights underlying 11 parcels of land in Manitoba, 10 parcels in Saskatchewan and six parcels in Alberta. As a result of these competitions, four leases were granted in Manitoba, six in Saskatchewan and

six in Alberta. Royalty was received from six wells in Alberta, six wells in Saskatchewan and 11 wells in Manitoba. At the end of the fiscal year, there were 537 oil and gas leases in the Provinces of Alberta, Saskatchewan and Manitoba administered by the Oil and Gas Section. Revenue from these public lands consisting of bonus bids, lease fees and rentals, extensions, assignments, and royalties amounted to \$201,138.25.

Mining—Northwest Territories and Yukon

Northwest Territories

A total of 2,293 quartz mineral claims were recorded during the year, 1,344 in the Yellowknife Mining District, 495 in the Mackenzie District and 454 in the Arctic and Hudson Bay Mining District. The trend in mineral claim staking and exploration was to gold, nickel and copper. Late in the autumn an interesting nickel-copper sulphide zone was discovered north of Fort Smith which commenced a minor staking rush to the area during the winter. Four placer gold claims were recorded in the Mackenzie Mining District and some interest was being shown on the known placer gold deposits in the Nahanni River area.

Uranium production was increased as one additional producing mine commenced shipping concentrates. Another mine shipped nickel-copper concentrate in excess of \$2 million in value. The three producing gold mines continued at a normal rate although production was down slightly from the previous year.

There are indications that at least one additional gold mine may be producing during 1960-61.

Revenue from miner's licences, quartz fees and royalty, and other fees totalled \$142,403.87.

Yukon Territory

In the three mining districts 798 quartz claims and 28 placer claims were recorded. The most active areas for mining exploration were the Quiet Lake, Selwyn Mountains, Rancheira River, 40 Mile River, and Wind River areas. A molybdenum showing proved interesting and a company was formed to do further development work with plans being made for underground operations in 1959. More ore reserves were determined on the asbestos deposit at Clinton Creek but production is not justified now owing to over-production elsewhere. There seemed to be a trend towards extensive exploration during 1959 in the Selwyn Mountain area for base metal deposits.

Production at the silver-lead-zinc mine on Galena Hill was decreased because of the low lead-zinc market price. The amount of gold produced was lower than the previous year.

Quartz fees and royalty, placer fees and royalty, and other fees produced revenue totalling \$110,476.75.

General

The total revenue from the mineral resources administered by the Resources Division amounted to \$8,636,664.76. This includes all sources of revenue from oil and gas in the provinces, the Northwest Territories, and Yukon Territory, as well as from both quartz and placer mining in the Yukon and Northwest Territories. The increase in revenue can be directly attributed to the bonus bids on oil and gas permits which had reverted to the Crown after being surrendered by permittees.

Lands and Timber

Yukon Territory

Although the total amount of revenue derived from the administration of lands in the Territory is lower than that received during the preceding twelve months, continued public interest in acquiring land is indicated by the substantial increase in the number of new leases and agreements of sale issued during the year.

To implement the policy recommended by the Interdepartmental Committee on Federal Territorial Financial Relations, all lots in new subdivisions at Haines Junction, McRae, Teslin and Watson Lake, were transferred to the Commissioner of Yukon Territory for disposal.

Complete survey plans are expected shortly of additional subdivisions at McRae and Watson Lake. These lands also will be turned over to the Commissioner for disposal.

Four parcels of land were sold to religious organizations at a nominal price of \$1.00 per parcel.

Twenty-three parcels of land were reserved for the use of various departments of the Government of Canada, making a total of 392 parcels in the Territory reserved at the 31st March, 1959, for government use.

At the request of the British Yukon Railway Company, arrangements have been made for the survey of a subdivision of approximately two hundred residential type lots, on land owned by the railway company in the southerly part of Whitehorse. A subdivision of similar size is to be surveyed at Porter Creek on Crown land, about two miles north of Whitehorse.

Permits for the removal of a total of 287,681 cubic yards of gravel, loam and rock, were issued during the year. Of this total, 274,621 cubic yards were used by the Government of Yukon Territory, for which no royalties were paid.

The volume of lumber produced decreased by approximately ten per cent with a corresponding drop in the amount of revenue received. The production of round timber and fuelwood is slightly in excess of the quantities cut during the previous year.

Northwest Territories

The number of land sales completed and agreements of sale issued compares favourably with the previous year.

A substantial increase in the number of new leases issued during the year denotes a continued interest in leased land. Although a number of cancellations were effected, leases in force for commercial and residential purposes exceed in number those in effect at the end of the 1957-58 year. During the year the survey plan of the Enterprise Subdivision at Mile 28, Mackenzie Highway, was completed, and all lots were transferred to the Commissioner of the Northwest Territories for disposal.

Sixty parcels of land were reserved for, or transferred to, various departments of the Government of Canada during the year, making a total of 429 parcels reserved for Government use at the 31st of March, 1959.

Owing to recent interest displayed in land at Franks Channel, 30 miles northwest of Yellowknife, arrangements have been made for the survey of a subdivision during the coming year, in addition to surveys of new subdivisions at Fort Smith, Hay River, Inuvik and Yellowknife.

A total of 1,620 cubic yards of gravel were removed under permit during the year.

The volume of lumber, round timber and fuelwood produced was approximately equal to the amount cut during 1957-1958.

Public Lands in the Provinces

Public Lands

These lands comprise former Ordnance and Admiralty Reserves, Public Lands previously administered by other Federal Government departments, and former Dominion Lands which were reserved for other departments but have reverted to the control of this department.

During the fiscal year 25 parcels of land were placed under this department's control by other departments, while parcels were alienated by transfer to the provinces, other Federal departments and the National Parks Branch. Ten sales were completed, two assignments were recorded and four appraisals were carried out. There are now 19 Agreements of Sale and 84 Leases in force, and an undetermined number of vacant parcels of land are being investigated. Six title searches were carried out and negotiations are being completed for the disposal of the lands concerned.

Dominion Lands Records

These records cover the administration of lands, timber, mining and grazing rights in Western Canada, the Railway Belt and Peace River Block of British Columbia, between 1873 and 1930, when the natural resources were transferred to the provinces.

During the past year, over 8,000 closed seed grain files were listed and shipped to the provincial archives, in accordance with the provisions of the 1930 Resources Agreements relating to records. One hundred and forty-three certified true copies of Letters Patent were prepared on request, and

71,385 Patents were indexed according to land description. Eight historical research projects were completed, and 15 title searches were carried out. More than 2,000 inquiries from other departments and the general public were dealt with.

Seed Grain Indebtedness

Between 1876 and 1925, the Federal Government advanced seed grain, fodder for livestock, and other relief to needy settlers in Western Canada, and secured the advances by liens registered against their homesteads, pre-emptions and other lands. Advances for fodder and relief in 1919-22 in Saskatchewan and Alberta were implemented on a joint 50-50 basis with the provincial governments. The Minister is authorized to investigate, adjust or write down individual accounts, and the Governor General in Council may approve cancellation of accounts, when warranted. Seed Grain Advisory Boards have been set up under Order-in-Council authority to investigate and report on the outstanding accounts in Alberta and Saskatchewan.

In 1958-59, the Seed Grain Advisory Boards made recommendations relating to 191 accounts, and one other account was paid in full, while 708 liens were discharged. Principal and interest totalling \$108,116.73 was written off and \$21,860.28 was received in payments during that period. On the 1st April, 1959, there were approximately 435 Federal and 590 Joint Federal-Provincial accounts outstanding. Over 800 inquiries concerning seed grain indebtedness were received from the general public, legal firms, Farm Loan Boards and the provincial governments.

Territorial Division

The re-organization of the Branch, by altering the geographical basis of administration, affected the responsibilities of the Territorial Division. While its direct supervision of field offices in the District of Mackenzie was transferred to the Office of the Director, it continued to provide advice on Yukon affairs while discharging its tasks relating to Territorial Government affairs in the Northwest Territories including the Arctic and sub-Arctic. It was therefore active in the operation of the Territorial Liquor System, the Workmen's Compensation Office, together with legislation and policies of the Council of the Northwest Territories relating to all territorial matters including game management and conservation, forest protection, health, welfare, labour, municipal affairs, professional and business licensing, motor vehicle control and taxation.

Northwest Territories

The Council of the Northwest Territories held two meetings during the year, both of which were in Ottawa. A review of the activities of the Council is contained in the Annual Report of the Commissioner of the Northwest Territories which appears in Appendix G to this report.

Aklavik Relocation

Work on the two departmental student residences being built to accommodate 500 students continued on schedule. Construction began on the 25-room federal school, the federal hospital and the federal office building for which pilings and foundation were placed the previous year. Northern Canada Power Commission let tenders for the superstructure of the powerhouse and central heating plant. A piling program for the main utilidor lines through the townsite was undertaken. Construction work on the airstrip neared completion. More lots were allocated for the use of residents of the old town and consideration was given to surveying an additional area for private, industrial and warehousing requirements. Further compensation negotiations were carried out with the valuation on only one or two claims remaining to be settled.

Fort Smith Town Planning

The 200-lot residential subdivision surveyed in 1957-58 was registered and the road allowances cleared in preparation for the laying of water and sewer lines. Thirty lots in the subdivision were reserved for immediate requirements of the Territorial Government. Consulting Engineers completed the design and specification for the revised water and new sewer system. Five per cent of the new water lines and 91% of the new sewer lines were laid. Proposed new access roads in conjunction with the new development plan of Fort Smith to complement the existing road system were discussed with residents of Fort Smith at a general meeting, and their approval obtained. A large warehousing area was laid out for the departmental requirement for machine repairs and general warehousing.

Wood Buffalo National Park

The continued emphasis on fire prevention to protect timber resources of this park were increased during the year. This involved new fire towers, ranger patrol cabins, and extension of the present trail and road system. In April and May of 1958, the inundations caused by the Peace River rising proved to be one of the most disastrous in the history of the park. It was estimated that up to 1,000 buffalo were drowned. Many of the animals were cows and calves, all basic breeding stock. Thus the buffalo management program together with the annual slaughter were curtailed.

The goldeye fishery was continued in Lake Claire and the season was successful. The first migration of whooping cranes into the park was observed on May 28, 1958. Eleven adult "whoopers" were counted in the nesting area. The birth of nine young cranes was the greatest breeding success in many years. During the summer of 1958 an investigation was carried out on the gypsum cliffs and from this investigation a large deposit of gypsum has been indicated.

Plans were made for sport hunting of buffalo in the Northwest Territories under a system of licensed outfitters and guides, the first hunting season to be the autumn of 1959.

Yukon Territory

The Council of the Yukon Territory met twice during the year. A complete review of the activities of the Territorial Government is contained in the Annual Report of the Commissioner which appears as Appendix H to this report.

The emphasis during the year was placed on added fire protection to conserve the forest areas. During 1958 the Yukon Territory experienced the worst fire season in living memory and steps were immediately taken to enlarge the fire suppression organization so that adequate fire suppression activity could be undertaken.

Added emphasis was given to the tourist industry by enlarging the tourist facilities and camping grounds along the highways in the Territory. As further evidence of interest in the tourist business, a survey was undertaken with the object of establishing national and territorial parks in the Territory.

Welfare Division

In 1956, the first social workers were employed to cope with some of the more pressing problems affecting Eskimos. During the intervening three years, a wide range of needed facilities and services was introduced and many new policies were recommended and implemented. A small welfare staff in Ottawa and in the field, working closely with administrators, teachers, policemen, missionaries and others, have built up a welfare program which now includes rehabilitation and medical social services, family and child welfare services, and a new emphasis on Eskimo language and culture.

The Welfare Division now makes possible a more complete integration of welfare services. Although the Division makes its services available to all residents in the Territories, welfare costs for Indians are charged to the Department of Citizenship and Immigration; the Territorial Government for all non-Eskimos and non-Indians.

The Welfare Division has four sections in Ottawa: an administrative section, a rehabilitation section, a family and child welfare section, and an Eskimology section. There is an increasing trend toward decentralization in the administration of various sections. A start in this direction has been made this year in welfare with the appointment of a Superintendent of Welfare for the Mackenzie District with offices at Fort Smith and a Regional Supervisor with offices temporarily at Aklavik. Similar appointments are scheduled next year with offices at Churchill, Frobisher Bay and Ottawa.

In addition to an establishment of eleven social workers, the Welfare Division is staffed by administrative officers, technical officers, interpreters and other specialists. Almost a quarter of the total staff in Ottawa and in the field are persons of Eskimo origin.

Rehabilitation

A pilot rehabilitation program was started in the Eastern Arctic almost two years ago. It is also evolving in modified form in the Mackenzie Delta.

The main feature of the program is a Rehabilitation Centre at Frobisher Bay which consists of housing for Eskimo residents, quarters for transients, a dining room and kitchen, a bathhouse, workshops, and other facilities designed for specific projects. The Centre admits Eskimos who can function adequately only under sheltered conditions because of illness and disability, Eskimos who, with assistance, can be placed in wage employment, and Eskimos who, with assistance, can be established in small self-sustaining businesses in the north. The Centre also provides shelter and food for Eskimos en route to and from hospitals.

The Centre now supervises an Eskimo-operated laundry, movie theatre, crafts store and concession, a sewing factory, a bakery, visitors' accommodation, and a low-cost housing program. In outlying settlements, where a shortage of purchasing power affects all families, cottage industries have been organized. The result has been a substantial reduction in relief costs. Cottage industries are now in operation at Povungnituk, Sugluk, Fort Chimo, Pangnirtung, Clyde River, Arctic Bay and Coral Harbour. Handicrafts are also bought at Cape Dorset and Grise Fiord. During the first year of operation, projects operated by the Rehabilitation Centre resulted in revenues totalling \$60,000.

A fundamental education approach, incorporating economic, social, health and welfare factors, underlies the program within the Centre itself. The program includes instruction in nutrition and the preparation of foods, child care, sanitation and management of income, and is intended to facilitate transition from a hunting to a wage economy.

The rehabilitation program in the north is complemented by medical social services which are made available to hospitals in the provinces where Eskimos receive hospital care. In the year ended March 31, 1959, there were 900 admissions of Eskimos to hospitals and 640 discharges. Most of these patients are victims of tuberculosis and need help with problems that result from illness. Social workers and interpreters of the Welfare Division make regular visits to these hospitals to assist in overcoming barriers of language and culture that sometimes hinder effective treatment. Contact between patients and relatives in the north is also maintained by facilitating correspondence, sending north medical progress reports at regular intervals, and in serious cases, arranging for close members of the family to visit a patient in hospital.

An arrangement with private and provincial Children's Aid Societies and rehabilitation agencies makes possible a wide range of social services

related mostly to discharge planning. In addition to counselling services that are made available in some instances, at point of discharge, care is taken to ensure that Eskimo patients return north properly equipped for Arctic conditions of life. Follow-ups are arranged whenever there is reason to believe that patients will encounter adjustment difficulties after discharge.

Because of the long distances and irregular transportation arrangements in the north, steps have been taken to erect transit centres at key settlements in the north. These facilities provide shelter and food to Eskimos en route to their homes and for patients being sent to hospitals.

Each summer, a member of the Welfare Division accompanies a medical survey party to the Eastern Arctic. The work of the medical team has been greatly facilitated in this way. The social worker assists in instances where persons have to be sent out to hospital by explaining the implications of the diagnosis to patients and relatives. Assistance is also given to dependants who may be left behind for long periods of time without guardianship or support.

Family and Child Welfare

In the year ended March 31, 1959, 522 Eskimo families were assisted with relief issues, expenditures averaging \$250 annually for each family needing relief. In this way, some families were helped over periods when hunting and trapping cannot provide a living, or when other employment is not available. Persons returning from hospital after treatment for tuberculosis are also eligible for this type of assistance.

Relief is regarded as a preventive measure; sometimes, when given in time, it staves off starvation and many times it prevents the physical debilitation which often leads to costly illness and hospital admission.

Residents in the Territories can be eligible for federal and territorial pensions such as Old Age Security, Old Age Assistance, and Blind and Disability pensions. Increasing knowledge of the allowances, especially among Eskimos, and increased case-finding facilities in the Welfare Division have resulted in a large increase of applications. Among the Eskimo population alone, 172 applications have been approved to date.

The existing system of family allowance payments in the north has been reviewed and changes recommended to the Department of Health and Welfare. Eskimos are the only remaining ethnic group in the Northwest Territories who receive their family allowance as a credit at the trading post rather than by cheque. A start has been made in introducing payment by cheque to four northern communities and the remaining communities will be converted to the new system over the next two or three years.

Negotiations have been completed to open a Home for the Aged at Chesterfield Inlet. The Home will accommodate aged persons who cannot be looked after adequately by their own families. Similar facilities are now in existence at Churchill and at Pangnirtung and will be introduced shortly in the Mackenzie District.

Although child welfare services in the north are still in a rudimentary stage of development, studies have been started as a preliminary to new legislation and higher standards. During this year 101 children were in the custody of the Superintendent of Child Welfare. An additional 19 children were in the care of the Yellowknife Children's Aid Society. A number of these children are in foster homes and institutions in the provinces and in residential schools in the Mackenzie District. The total also includes children in correctional institutions in Alberta and Manitoba.

The high rate of hospital admissions and other forms of family dislocation has created an urgent need for facilities which would provide temporary care for children. An Eskimo-operated Children's Receiving Home was started at Churchill a year ago. During this time, it provided care for a total of 81 children from the Keewatin District alone. Similar Homes are to be introduced at Fort Smith, Inuvik and Frobisher Bay.

Eskimology

The Eskimo language section of the Welfare Division serves as a very necessary bridge between two languages and cultures. Any welfare service relies heavily on good communication with the people it is serving, if it seeks to be effective. In the north, the Welfare Division would be especially handicapped without this type of communication.

The Welfare Division receives on an average between twenty and thirty letters a week in the Eskimo language. Most of these letters originate with patients in hospital or with relatives who are worried about members of the family who are in hospital. Eskimo members of the staff translate all letters into English and in consultation with social workers, prepare replies.

Eskimo staff provide interpreting services in the various hospitals and occasionally accompany social workers on trips in the north. They also fulfil an important consultative function in matters pertaining specifically to Eskimo culture and language and conduct Eskimo language courses.

The publication this year of *Inuktitut*, an Eskimo language magazine, marks a major effort to bolster some aspects of Eskimo culture and assist Eskimo people to maintain a sense of self-worth in the face of crumbling traditions and customs. *Inuktitut* (The Eskimo Way) publishes material submitted by Eskimo writers and reproduces Eskimo art work.

National Parks Branch

Administration of the National Parks is carried on by four divisions: the National Parks Service, the National Historic Sites Division, the Engineering Services Division, and the Canadian Wildlife Service.

National Parks Service¹

"The tendency nowadays to wander in wildernesses is delightful to see. Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home; that wilderness is a necessity and that mountain parks and reservations are useful, not only as fountains of timber and irrigating rivers, but as fountains of life."

This observation is as true today as it was when written by John Muir, American naturalist, writer and lover of wilderness, in 1898. As an indication of the tendency "to wander in wildernesses" visitor attendance at the National Parks in Canada during the year 1958-59 reached 4,287,343, a new record.

The most encouraging feature relating to park attendance was the increase in camping. During the 1958 season approximately 277,000 persons used the public camping grounds in the parks. The average stay was 4.3 days, making an estimated total of 1,195,000 camping days. This compares with 1957 figures of 225,000 campers and 980,000 camping days.

Notwithstanding the fact that the parks administration has been progressively expanding campground facilities during recent years, the progress made so far was not sufficient to cope with the increased use in 1958 and as a result many of the campgrounds were taxed to capacity. The heaviest increase was experienced in the parks in eastern Canada, where a remarkable interest in camping has developed during the past few years. To meet the increased demand for camping facilities, it is planned to spend approximately \$1,300,000 on development over the next two years. This figure covers only new campgrounds and does not take into consideration the cost of operation, maintenance and renovation of existing installations.

There is no novelty in new records of total attendance and use of public campgrounds. The total attendance at the parks has reached a new height each year since the impact of World War II brought attendance to a low of 226,000 in 1942-43. Although the novelty of new records is gone, with their implied compliments, they remain gratifying.

However, there is a reverse side to the coin that creates some apprehension. Every facility has a limit of usability. When that limit is reached, use must be restricted. With constantly growing attendance at the parks, the day may come when people may have to be refused admittance. Considering the 4,200 square miles area of Jasper National Park alone, the possibility of having to refuse admissions seems preposterous. However, when

¹See Appendix C, Nos. 1 to 6.

thinking of the National Parks, the limiting factor is not how many people an area can support in a physical sense. Rather, it is how many can use the area without gradual deterioration destroying this great national heritage. It is the perpetuation of these areas of natural beauty, undiminished by present use, for the benefit of future generations, which is the main objective of the National Parks Service.

Following this line of thought, the most significant development of the past year has been the work of the long range development planning section, which was established in 1957-58. The first important task of this unit was the establishment, in co-operation with other officers of the Department, of a broad policy of administration and development of the parks. This policy was drafted early in 1958. Working within its limitations and guided by it, the planning section then took the first steps to guarantee, in so far as it is humanly possible, that "Parks shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations".

An inventory of all developments within each National Park was completed. This inventory will be weighed against the needs and uses, future as well as present, of each park and a long range development plan devised for each park. Long range plans have already been drawn up, on a priority basis, for Point Pelee and Elk Island National Parks. Plans for a visitor service centre at Lake Louise in Banff National Park were also completed. Coupled with this, an aerial survey program was initiated to assist in planning and engineering. With the gathering momentum of the planning section's efforts, it is hoped the day will never come when a visitor need be refused admission to a National Park.

Private enterprise within the parks was also responsible for providing or improving visitor facilities. In Banff, 83 building permits were issued for a total construction value of \$1,704,428. Six of these permits were for construction exceeding \$25,000. The two largest developments were the gondola lifts at Sulphur Mountain and Mount Whitehorn in Banff Park.

At the Whitehorn development, concrete bases have been poured for 33 towers and 13 towers completed. At the upper terminal, footings and walls were poured and the machinery foundation 60 per cent poured. At the lower terminal, excavation has been completed for the counterweight shaft.

On Sulphur Mountain the upper terminal concrete walls and footings were poured, machinery base 75 per cent poured and structural steel erected.

In Jasper, 76 building permits were issued for a total construction value of \$585,441. Similar expansion, on a reduced scale, occurred in other parks with permanent townsites.

A winter works program was undertaken commencing in November, 1958. By the middle of December more than 1,000 men were employed. The number rose steadily until early March, 1959, when 1,913 men were on the payroll. Over 1,500 men were given steady employment from January 15th until March 31st. A total of 6,415 man-months of employment was provided.

The third year of the previously reported 8-year program for the major reconstruction of park highways saw considerable progress. Further progress was made in the construction of the Trans-Canada Highway through the National Parks. During the year the section of the highway from the east gate of Banff Park to the west gate of Yoho Park was opened for public travel following the completion of grading and the laying of the stabilized bituminous base course. The final course, or lift of asphalt, will be laid in 1960.

In Glacier National Park clearing and grubbing was completed over the entire right-of-way. Six grading contracts involving 23.3 miles were awarded and work commenced on the base course. Contracts were also awarded, and work commenced, for three bridges and a reinforced concrete arch culvert over the Illecillewaet River. In addition, construction was started on an overpass of the Canadian Pacific Railway as well as bridges over Loop Creek and Beaver River. In Mount Revelstoke Park clearing and grubbing was completed for the full 7½ miles. A contract was awarded for the grading. Contracts were also awarded for the various structures required in conjunction with the highway. In Terra Nova National Park, grading work was continued. The contract for Miles 18 to 25.2 was completed. Two other contracts, for Miles 0 to 10 and 10 to 18 were 45 per cent and 96 per cent completed respectively at the end of the year.

Contracts were let for gravelling and grading on the Banff-Jasper Highway. On the Banff-Windermere Highway preliminary drainage, stripping and waste cuts were carried out from Miles 1 to 7. The highway from Miles 32 to 56 in Kootenay Park was paved to a width of 44 feet. Grading and clearing was carried out on other sections and the replacement of 4 bridges, commenced in 1957, was completed in 1958. In Prince Edward Island Park, satisfactory progress was made on the reconstruction of the Gulf Shore Road between Rustico and New London. Fifteen miles of the Cabot Trail in Cape Breton Highlands Park were paved. In Prince Albert Park seal-coat patching was applied to approximately 16 miles of the Was-kesiu Highway. The foregoing information relates to major projects only.

The development of Terra Nova—the latest addition to Canada's National Parks system—was continued. A number of permanent buildings required for administration purposes were completed, together with ten units of a cabin development to be utilized for visitor accommodation when the park is opened for public use. In addition to the section of the Trans-Canada Highway already mentioned, the construction of other roads within the park was undertaken. A forest protection service was organized and manned by the appointment of a Chief Warden and 2 Wardens. Fire-fighting equipment was purchased and work started on the construction of 2 fire look-outs, warden residences, and fire access trails. Officers of the Forestry Branch of the Department began the preparation of a forest management plan for the park.

A total of 40 forest fires burned a total of 1,404 acres throughout the parks. However, over 1,000 acres of this total was grassland and many of

the fires were simply "spot" fires and were extinguished without loss, so that the total timber value lost was only \$596. Of the 40 forest fires, 10 were caused by smokers; 5 by campers and various public works; 4 by lightning; 3 by railways; 2 by settlers; and 3 by miscellaneous human agencies. Four fires started from unknown human causes and 4 fires were of incendiary origin.

The practice of acquiring title to freehold lands within or adjoining park boundaries for the purposes of National Parks was continued as funds and opportunity permitted. During the year a valuable parcel containing approximately 115 acres near Banff, and a small parcel in the vicinity of Lake Louise, in Banff National Park, were purchased. Two small parcels adjoining the boundary of St. Lawrence Islands Park were also acquired, and negotiations entered into respecting the purchase of privately-owned lands within the boundaries of other parks.

Engineering Services Division

The past year witnessed enlarging of facilities preparatory to undertaking, by contract, a much larger share of the construction program. By the summer of 1959, construction farmed out to the Department of Public Works will be limited for the most part to the reconstruction of trunk highways within the National Parks.

Water systems, staff housing, administrative buildings, comfort stations, central service garages, warehouses, and smaller structures and facilities were designed by the Division's architects and engineers. The Landscape Planning Section furnished landscape designs for all new construction and worked on a backlog of modernizing landscaping for existing structures and facilities in the National Parks of Canada.

The Division prepared technical specifications and requisitions and reviewed tenders for the purchase of heavy road building equipment, power operated equipment for machine and carpenter shops, building construction materials, engineering, survey and scientific equipment, trailers for construction camps, grass seed, fertilizer, and other materials generally requiring some measure of technical knowledge.

The architectural designs of buildings and structures planned for erection in the National Parks by private concerns were examined and approved, or modification recommended.

The Division, through the offices of Supervising Engineers at Banff, Alberta, Halifax, Nova Scotia and in its Ottawa Office, prepared numerous plans for road location, site conditions, boundary line delineation and various other ground surveys. The Division awarded aerial survey and mapping contracts totalling more than \$72,000 and supervised the work of all three contractors.

The Division selected and trained technical personnel. Engineers and technicians were seconded to the Park Superintendents to serve as resident engineers, draftsmen and building inspectors.

The Division provided direct supervision for all construction projects undertaken on behalf of the Historic Sites Division. Supervision was also provided for all work undertaken by contract in the National Parks. Some of the more interesting projects undertaken are as follows:

- (1) Construction of a promenade between Dufferin Terrace and the National Battlefields Park, Quebec City. The contract was awarded to Emile Frenette Limitee, Quebec City, in the amount of \$379,635. Work was 15 per cent completed this year.
- (2) Construction of a bathhouse and swimming pool with associated car parking lot, Waterton Lakes National Park, Alberta. Contract was awarded to Bennett and White Alberta Limited, Calgary, Alberta, in the amount of \$425,209.25. Work was 5 per cent completed this year.
- (3) Construction of a floodlighting and a secondary electrical distribution system, Halifax Citadel, Halifax, Nova Scotia. A contract was awarded to Bedard Girard Limited, Montreal, Quebec in the amount of \$24,600. The contract was 60 per cent completed this year.
- (4) Construction of a Central Service Garage, Waskesiu Townsite, Prince Albert National Park, Saskatchewan. A contract was awarded to Patrick Construction Co. Ltd., Saskatoon, Saskatchewan in the amount of \$114,785. The contract was 40 per cent completed.
- (5) Restoration of Fort Langley, B.C., under an agreement with the Province of British Columbia. This project was begun in 1956 and was completed in 1958 at a total cost for the three years under construction of \$307,685.41, toward which the Province of British Columbia contributed \$125,000.
- (6) Construction of a 350,000-gallon reservoir and a water supply system for the Headquarters Area, Fundy National Park. The reservoir was completed and a good beginning was made on the water system. A contract was awarded for the construction of a masonry valvehouse and a masonry pumphouse to Foundation Maritime Limited, Halifax, N.S., in the amount of \$68,054. Twenty per cent of the work was completed this year.

National Historic Sites Division¹

The National Historic Sites Division is responsible for the operation and maintenance of 20 national historic parks and for the care and preservation of 574 historic sites which have been erected since 1922. The Historic Sites and Monuments Board of Canada, comprised of authoritative historians

¹See Appendix C, 7 to 9.

from each province, advises the Minister on the marking of historic sites, the commemorating of persons and places including buildings of national historic interest by reason of their age or architectural design.

During the year the old Commissariat Building, 17 St. Louis Street, Quebec City, was acquired. Restoration of the house was begun early in 1959 and it is hoped work will be completed early in 1960. Work at Cartier-Brebeuf Park, commissioned by the Historic Sites Division, was carried out by the National Battlefields Commission. Land was acquired at the Alexander Graham Bell Museum, Batoche, Fort Malden, Grand Pré and Signal Hill National Historic Parks. Negotiations for additional areas were continued at Fort Malden.

The program of erecting monuments to mark historic places, events and prominent figures in Canadian history was continued with the establishment of tablets at Kamouraska, P.Q.; Parliament Buildings, Toronto, Ont.; Windsor, Ont.; Gravelbourg, Sask.; McLeod's Lake and Victoria, B.C.; University of Saskatchewan, Saskatoon, Sask. and Newcastle, N.B.

Canadian Wildlife Service¹

Waterfowl breeding conditions and waterfowl populations were again studied throughout all the provinces and territories in co-operation with the U.S. Bureau of Sport Fisheries and Wildlife and provincial and other game agencies. Factors affecting the production and survival of ducks were investigated in detail, and the problem of waterfowl damage to crops continued to receive attention.

A waterfowl kill survey by mail was conducted in Quebec and New Brunswick.

Spring counts of woodcock were carried out in the eastern provinces, and the status of the species was studied.

Among the investigations carried out was one dealing with waterfowl concentrations in the Western Arctic. Ground investigations were carried out in the Anderson River breeding area. Data were obtained on the breeding biology and food habits of and predation on brant, snow geese, swans, white-fronted geese and ptarmigan. Wildlife surveys of Somerset Island and surrounding islands were carried out by aeroplane. At a banding station on Mills Lake, Mackenzie River, more than 2,000 ducks were banded.

Organization of banding programs and participation in them were continued during the year. A total of 129,295 records of banded birds were received and processed during 1958.

Administration of the Migratory Birds Convention Act was continued in conjunction with the Royal Canadian Mounted Police and in co-operation with the provincial game branches.

¹See Appendix C, 10 and 11.

The intensive study of caribou conducted jointly by federal, provincial and territorial agencies was completed in the autumn of 1958. A preliminary report was presented in November and a final report in February. The results of the study were considered by Committees representing both technical and administrative personnel of the several agencies concerned and recommendations for action were evolved.

After the termination of the co-operative study, the Canadian Wildlife Service continued physiological investigations of caribou at Yellowknife and distributional investigations at Aklavik. Observations of caribou also were continued in the vicinity of Dawson, Yukon.

During the summer of 1958 musk-oxen at Lake Hazen, Ellesmere Island were studied as part of the International Geophysical Year program there. Results of this study, and of previous studies of the species, were compiled during the succeeding winter period.

White fox investigations were resumed in the eastern Arctic, and wolf control operations were continued in Mackenzie and Keewatin Districts as an aid in caribou conservation. Investigations in the National Parks involved bighorn sheep, elk and beaver in the western parks, and buffalo, beaver, mink, and squirrels in Wood Buffalo Park.

Surveys of lakes and streams and fisheries management projects in the National Parks were conducted by three limnologists and summer assistants. The program of reclaiming trout waters polluted with coarse fish was continued and several lakes were treated with chemicals toxic to fish life. Thanks to the application of modern procedures the production of park fish hatcheries was increased. Since hatchery plantings are essential to maintain adequate populations of trout for recreation owing to lack of suitable spawning facilities, investigations were conducted to further improve the efficiency of fish culture operations in the Mountain Parks.

The pilot plant was installed at Riding Mountain Park for the hatching of yellow walleye eggs and the rearing of fry and fingerlings in nearby potholes. Full grown fingerlings were planted in Clear Lake. Assistance was given to park authorities in the control of nuisances, such as mosquitoes, black flies, algae and aquatic weeds, in areas frequented by visitors.

Advice and assistance were provided to the Northwest Territories Administration for the development of a rainbow trout fishery in Wood Buffalo Park.

Water Resources Branch

The Water Resources Branch comprises two Divisions: Operations, which is responsible for most of the basic Branch functions, and Hydraulics, which is responsible for special studies required in the solution of waterway problems referred to the Branch. It carries out the systematic hydrometric survey program throughout Canada, studies and analyses problems involving waterways of federal-provincial and international concern, compiles the water power resources inventory of Canada and administers legislation concerning international rivers, water power and water conservation.

The Branch co-operates with public and private agencies in water-power and water-supply problems, in the maintenance of gauging stations and in the performance of hydrometric surveys and investigations of mutual concern. The Branch Director and senior engineers are active members of numerous federal-provincial and international engineering boards and boards of control established to deal with waterway problems. The Director also is a member of the Northern Canada Power Commission. As a part of its continuing hydrometric survey program, the Branch operates certain gauging stations of international interest in co-operation with appropriate United States Government agencies.

Special investigations were carried out during the year in connection with Lake Ontario and with the Columbia, Fraser, Yukon and St. Lawrence Rivers. Through its Director as Honorary Secretary of the Canadian National Committee, World Power Conference, the Branch participated in the Canadian Sectional Meeting of that Conference which was held at Montreal in September.

Hydrometric Surveys

Conduct of the systematic hydrometric survey program comprises a major part of the Branch activities. A large part of the program is operated in co-operation with some 78 different organizations including various federal, provincial, municipal and private agencies. Most of these organizations have been listed in Appendix "D" of the Department's 1957-58 Annual Report. Field operations of the Branch are carried out through six District Offices and thirteen sub-offices distributed across the country from Newfoundland to the Yukon Territory. As part of the maintenance of 1,268 gauging stations, field operations during the year included 7,206 stream discharge measurements and 2,097 additional inspections of gauging stations.

Records compiled from the operation of the hydrometric survey program are published in biennial Water Resources Papers, each of which covers one of four main drainages of Canada. Papers covering the Atlantic drainage and the St. Lawrence and Southern Hudson Bay drainage were issued during the year.

The Current Meter Rating and Experimental Station located at Calgary was operated for the repair and calibration of current meters and related equipment and for the investigation of new types of pertinent instruments. Its services were available also to other organizations. Based upon the flow records from 23 typical rivers distributed across Canada, a monthly statement covering stream flow conditions in Canada was released to the public early in each month. The flow records were supplied also to the United States Geological Survey at Washington which published a monthly summary of stream flow in North America.

For Canada as a whole, total runoff for the year was slightly above normal, the average for the 23 typical rivers being 114 per cent of their median flow. In Manitoba and in the more southerly rivers of Ontario, well below normal flows were general for most of the year. Similarly, low flows occurred in British Columbia during the summer months and in southern Quebec during the late autumn and winter periods. Well above normal runoff occurred in New Brunswick and southern Quebec during the summer months, in Alberta and British Columbia during the spring and winter periods and in northern and northwestern Ontario for the greater part of the year.

On several rivers subject to dangerous floods frequent observations of stage were obtained and a flood warning service was provided during periods of high flow. Water levels were obtained at 26 key locations in the Columbia River and Fraser River basins in British Columbia, at about 20 locations in the Saskatchewan River basin in Alberta and Saskatchewan, and to a smaller extent on certain rivers in some of the other provinces. From this information, together with a study of river conditions and current meteorological data, day-by-day computation of probable stages in the lower reaches of these rivers was made available to interested agencies. In Alberta, the District Office at Calgary participated in the work of the Bow River Ice Committee in alleviating the flood hazard caused by ice jams in the Bow River.

The customary annual program of snow surveys was carried out in areas where this information is required to prepare estimates of the amount of spring runoff. It supplements similar programs operated in different areas by other agencies. As part of a continuing program of biennial surveys of representative glaciers in British Columbia and Alberta, seven glaciers in these provinces were surveyed during the year.

Waterway Problems and Water Power Administration

Personnel of the Branch served on twenty-two international and six federal-provincial boards and committees, which were established to study problems relating to the control of boundary or other waters. In addition, Branch representatives served on or assisted in the work of seven miscellaneous national committees related to one aspect or another of the water resource field. The District Offices of the Branch assisted other federal

agencies by the provision of engineering advice with respect to specific water problems and by providing administrative assistance with respect to certain federal lands.

In connection with its representation on the International St. Lawrence River Board of Control, and the International Lake Ontario Board of Engineers, the Branch participated in an extensive study of the regulation of Lake Ontario to determine the most effective use of storage on the lake in the operation of the St. Lawrence River power project in the International Rapids reach of that river and the Seaway project from Lake Ontario downstream to Montreal. This study evolved the plan of regulation of Lake Ontario which has been adopted by the United States and Canada. Plans and specifications for the works in the International Rapids reach of the St. Lawrence River were approved by the Board in so far as those works affect the levels and flows of the St. Lawrence River and Lake Ontario.

The Branch continued to provide technical advice to the Department of External Affairs and to the Canadian Section of the International Joint Commission in their considerations and studies of international waterway problems which have arisen on various rivers across Canada. Among the most important studies of this nature undertaken by the Branch are those of the Columbia River. In March 1959, the International Columbia River Engineering Board presented its report to the International Joint Commission marking the end of 15 years of detailed investigation of water resource development, in which the Branch has made a major contribution. The report presents alternative plans of development with a primary objective of producing the maximum feasible hydro-electric development of the international basin. During the year the Branch participated in the work of several advisory committees set up by the Governments of Canada and British Columbia to study ways and means of bringing about early development of Columbia River power under co-operative agreement with the United States. The most important feature of these studies has been the problem of measuring and apportioning between the two countries the downstream benefits in power production and flood control which would accrue in the United States from the use of storage projects in British Columbia. This work is continuing in close collaboration with the International Joint Commission.

The Yukon River has been the subject of previous study to determine the possibilities of diversion of its upper reaches into the Taku River system for power production in northwestern British Columbia. Since the Canadian portion of the Yukon River with its tributaries lies almost wholly within the Yukon Territory and hence is a federal responsibility, the Branch continued its power resources reconnaissance survey, initiated in 1956. When this work has been completed, it will be possible to provide a reliable estimate of the power potential of the Yukon River system which might be developed within the Yukon Territory.

In the study of the water resources of the Souris and Red Rivers by the International Souris-Red Rivers Engineering Board consideration has been given to the advantages and disadvantages of diverting Missouri River water to the Pembina River by way of the Souris River.

In eastern Canada the International Passamaquoddy Engineering Board was active in its engineering and planning on development of power by the tides of Passamaquoddy and Cobscook Bays. The Board has completed the required field surveys and is currently preparing its final report.

As part of its investigation of the water resources of the St. Croix River basin, the International St. Croix River Engineering Board assisted in the public hearings held by the International Joint Commission in June 1958 to solicit briefs on proposals in development of the water resources of that basin.

During the year the Branch continued to participate in the activities of the Advisory Committee on Water Use Policy. Personnel of the Branch offered technical advice and co-operated with the Secretariat of the Committee in a number of its assignments.

An important part of Branch activities is the provision of technical assistance in investigations and studies being conducted on a joint federal-provincial basis.

The Branch continued its participation in the studies being made under the direction of the Fraser River Board to determine the possibilities of general Fraser River basin development with particular reference to flood control and hydro-electric power generation. This Board was established by the Governments of Canada and British Columbia and in 1956 it submitted an interim report covering investigations to that time. Late in 1958 the Board completed a preliminary report outlining the results of its studies and its recommendations with respect to flood control and hydro-electric power development. Several major schemes of comprehensive development were included in this report which is now under consideration by the Governments of Canada and British Columbia.

In January 1959, the Technical Liaison Committee on British Columbia Power Problems was established by the Governments of Canada and British Columbia for the purpose of reviewing all available technical information affecting federal-provincial interests in the power supply problems of British Columbia, with particular emphasis on the Columbia River power potential.

The Lakes Winnipeg and Manitoba Board was established in 1956 by the Governments of Canada and Manitoba to investigate and report upon the possibilities of further development and control of the resources of waters within Manitoba flowing into and from those lakes, with particular reference to flood control and hydro-electric power generation. In mid-1958 the Board submitted its final report to the two Governments, thereby completing the assignment under its terms of reference.

In March 1959, the Saint John River Board was established by the Governments of Canada and New Brunswick for the purpose of determining how the present and future power developments in New Brunswick would be affected by the development and operation of storage on the upper Saint John River and its tributaries.

The Branch administers the Dominion Water Power Regulations, in regard to water power developments carried out on federal lands. One final licence and one priority permit were issued during the year and another final licence in April 1959. The Branch was active also in the consideration of various matters regarding several other water power developments and carried out its regular function with respect to the collection of rentals for each of the nine developments under federal licence. Rentals collected during the year totalled \$50,645.73 of which amount \$6,090.25 was collected for the National Parks Branch of this Department and \$32,416.11 for the Indian Affairs Branch of the Department of Citizenship and Immigration.

The Branch conducted its activities relevant to its responsibilities for the administration of the International River Improvements Act and Regulations and the Canada Water Conservation Assistance Act. Annual reports detailing the Branch's activities in this respect are tabled in the House of Commons.

Based upon the Branch's hydrometric surveys, field investigations and other data, the current estimate of the water power resources of Canada is 66,203,000 h.p. at ordinary six months flow. During 1958, a net total of 2,485,040 h.p. of new hydraulic capacity was added, bringing the total installed capacity of all water power developments in Canada to 22,379,626 h.p. New stations and extensions under active construction for operation in 1959 were estimated at about 2,000,000 h.p.; others with a total capacity exceeding 2,600,000 h.p. were under preliminary construction or were definitely planned for development.

Three regular annual water power bulletins and one bulletin covering thermal-electric installations in Canada were issued during the year, and water power articles were revised for several publications of other agencies. A special publication entitled "Water Powers of Canada" was released initially at the Canadian Sectional Meeting of the World Power Conference in September 1958, and further distribution was made subsequently to public libraries and co-operating agencies.

Forestry Branch

The Forestry Branch carries out programs of research directed towards the improvement of forest management and the utilization of forest products. It administers agreements with the provinces through which federal financial assistance is extended for certain forestry activities carried on by provincial departments. Forest surveys are undertaken and advice on forest management provided for forest lands administered by this Department and other federal departments.

The Forestry Branch is organized in three divisions, namely, Forest Research Division, Forest Products Laboratories Division, and Forest Operations Division. In addition, there are separate sections dealing with Forest Economics and Branch Administration. New Forest Products Laboratories at Ottawa and Vancouver were occupied and the latter was formally opened in February 1959. The new laboratory building at Point Claire, Quebec, provided for the use of the Pulp and Paper Research Institute of Canada, was opened in September 1958.

*Forest Economics*¹

Research in the economics of forestry provides the basis for intelligent decisions on the economic aspects of managing forest lands and of utilizing their products and services. It embraces the whole range of economic activities which relate to the use of forest resources, including the fields of consumption, distribution and processing of the products of the forest.

The Forest Economics Section provides both statistical and economic services. In addition to maintaining basic data on forest resources and on production, consumption and trade, and forest products, it acts in an advisory capacity to the Director on matters of economic policy. Its economic activities include the analysis of forestry statistics, studies of legislation relating to forestry, the preparation of economic reports to international organizations, such as the Food and Agriculture Organization and the Economic Commission for Europe, and research projects in the economics of forestry.

The Section continued to provide a representative on the Interdepartmental FAO Committee. Advisory assistance was given to the Technical Co-operation Service of the Department of Trade and Commerce in providing courses of instruction for forestry graduates and students under the provisions of the Colombo Plan and the Expanded Technical Assistance Program.

¹See Appendix D, 1 to 3.

Forest Industries

Canada's forest industries in 1958 were affected by the North American business recession which began in 1957. Production and shipments declined substantially in the first half of the year but showed a marked recovery by the year's end. The major effect was the reduction of abnormally high stocks of lumber and plywood. Newsprint production declined despite a continuing increase in the industry's capacity.

Lumber production increased slightly over 1957 but remained seven per cent below the 1955 record figure of 7.9 billion board feet. Exports of lumber to the United States increased by 15 per cent but shipments to the smaller United Kingdom market declined by 14 per cent.

Newsprint output declined by five per cent to approximately 6.1 million tons in 1958. The operating ratio in Canadian mills fell from the 1957 figure of 95 per cent to 84 per cent.

Total utilization of forest products in 1957 dropped from 1956 by 10 per cent to 3,100 million cubic feet. This was two per cent lower than the average utilization for the 10-year period 1947 to 1956.

Forest Research Division¹

Research activities included fact-finding surveys to evaluate existing conditions, fundamental studies concerning the characteristics and behaviour of forest species and the influence of different factors of their environment, and applied research to develop practical methods for influencing forest development and improving operating and research techniques.

The Forest Research Division conducted research in silviculture, management, ecology, tree physiology, tree improvement, and reforestation from six district offices located at Calgary, Alta.; Winnipeg, Man.; Ottawa, Ont.; Valcartier, Que.; Fredericton, N.B.; and St. John's, Nfld.; and at the Petawawa Forest Experiment Station. Studies in tree physiology were also conducted in British Columbia and an ecological reconnaissance made in the Northwest and Yukon Territories. Research in forest inventories methods and in fire protection was conducted by two sections located in Ottawa.

Silviculture and Related Research

Silviculture deals with the theory and practice of controlling forest establishment, composition, and growth, while forest management is concerned with the application of business and technical principles to the operation of forest properties in order to achieve continuous production, with the net growth and harvest in approximate balance.

¹See Appendix D, 4.

The principal tasks within this field of forest research are as follows:

1. Development of satisfactory systems for classifying forests and forest sites as a basis for proper silviculture and management. This includes a study of physiographic and edaphic features, lesser vegetation, and the forest itself.
2. Determination of the silvical characteristics of Canadian tree species and the ecological relationships of the associations in which they occur. Included are fundamental studies of plant growth as related to such factors as temperature, light, moisture, frost, and studies of succession, all of which determine the character of the forest.
3. Development of methods of silviculture applicable to the more important forest types and to Canadian economic conditions. Studies are concerned with economic and practical harvesting methods for existing forests and experimentation to ensure future forests of desirable species.
4. Development and testing of practical methods for the actual and potential growth and yield of forests. An assessment of the potential productivity of forest sites and an accurate prediction of future yields of forests are essential for long-term management.
5. Development of improved techniques for reforestation and of improved strains of tree species suitable to Canadian conditions. Included are studies for the improvement of planting, seeding, and nursery techniques, and the development through selection and hybridization of better trees for use in reforestation programs.
6. Improvement of methods of organizing forest data into plans of regulation and silviculture for forest areas suitable to different intensities of management. This provides not only technical information for the implementation of management, but also valuable demonstration of various intensities of management in commercially important forest types.
7. Improvement of research methods, mensuration techniques, and the design of experiments. Experimental designs are developed to ensure the validity of results, mathematical functions of growth developed, and mensurational techniques tested and improved.

In all districts, studies of forest and forest site classification were in progress to provide the basic framework within which both research and forest management must be conducted. Fundamental ecological studies, tree breeding, provenance studies, and research in tree physiology continued, with the major part of this work being done at the Petawawa Forest Experiment Station, Chalk River, Ontario.

Tests of silvicultural techniques, with emphasis on regeneration following cutting and fire, continued in all districts. Basic data were obtained as a preliminary to the management of selected and representative forests in

each district, and data collected as a basis for the preparation of yield tables for important species. Studies of different cutting practices were expanded to include additional important forest types. Requests continued from forest industries and provincial agencies for technical assistance in planning such applied experimentation.

Forest Inventories Research

Stand volume tables based on factors ascertainable from air photographs are being prepared to facilitate estimates of the quantity of timber per acre in various forest types. Data were collected in northern forest stands on the Peace and Slave Rivers.

Methods of air photography are being investigated to obtain maximum forest information at minimum cost. Studies of photographs taken with air cameras of improved design or with special films are being made. Techniques of controlling the blur that occurs because the air camera is on a moving platform are under investigation in relation to large-scale sampling photographs.

Instruments and other equipment for use in the field and for interpretation of air photographs are being tested.

Research in methods of field sampling with particular regard to co-ordination with information obtainable from the air photograph is being conducted. Investigations in point sampling and in measurement of tree heights and recognition of species in air photographs were made.

Fire Protection Research

Many problems relating to the protection of forests against fire were studied. Most investigations were made at the request of provincial and other forest protection agencies, which often co-operated in them. Most members of the staff of the Section are in Ottawa, but the research is conducted during the fire season in the field at forest experiment stations or at temporary fire-research stations.

Two field parties continued investigations in British Columbia, one on Vancouver Island and the other on the Cariboo Plateau of the interior, to obtain data for the preparation of fire danger tables for the province. Analyses of the field data obtained in Alberta and Saskatchewan for fire danger table preparation were completed and provisional editions were published.

A field study of fire behaviour was commenced in Ontario to obtain data relating to forest fuel-type classification. Laboratory investigations to determine the equilibrium moisture content and rate of moisture loss or gain in some common forest fuels were begun at the Petawawa Forest Experiment Station. Plans were prepared for conducting experimental prescribed burns. A new type of device for folding forestry hose was designed.

Forestry Operations Division

Agreements between the Governments of Canada and the provinces, under the Canada Forestry Act, were administered by this Division, providing federal financial assistance to provincial forest inventories, reforestation, fire protection and forest access road construction. Federal participation, in the cost of an aerial spraying operation against the spruce budworm in New Brunswick was continued in 1958, but the infestation has now subsided. Total contributions by Canada to the provinces under the forestry agreements, since their inception in 1951, amount to more than \$15 million.

This Division is also responsible for conducting forest surveys and for advising and assisting other branches and departments of Government on forest management in forest areas under federal jurisdiction. The provision of forest fire protection and timber administration at Camp Gagetown, New Brunswick, was continued in co-operation with the Department of National Defence. A small education unit was also maintained by the Division.

Provincial Agreements¹

Forest Inventories

Under the terms of the federal-provincial agreements respecting forest inventory, the Federal Government pays half the cost of the approved programs of the seven participating provinces. These agreements, executed in 1956, provided for completion of the initial inventories by March 31, 1958, and for maintenance of the inventories until March 31, 1961.

Last year the completion of all initial inventories was reported, but a number of the final reports had not yet been published. By March 31, 1959, reports were available for each participating province encompassing a national gross inventory area of 1,129,000 square miles.

In 1958-59 all the provinces were engaged in inventory maintenance. This work is carried out in areas where disturbances such as cutting and fire, or where growth and changes in stand structure, have significantly affected the initial inventory estimates. For the most part, current maintenance work is being conducted in areas which were inventoried prior to 1951, and in general inventory maintenance work will be carried out on an approximate 10-year cycle.

Reforestation

Under the agreements, the participating provinces which maintain their reforestation programs on unoccupied Crown lands at a level equal to or above the previous three-year average are entitled to a federal contribution of \$10 per thousand trees planted and \$1 per acre seeded. In addition, the Federal Government contributes one-fifth of the cost of establishing and operating new forest nurseries.

¹See Appendix D, 5 to 7.

The Province of Prince Edward Island, under a special agreement, receives 50 per cent of the cost of reforestation on waste lands unsuitable for agriculture.

In 1958-59, payments were made to six provinces for the planting of a total of 15,548,000 trees, the seeding of 374 acres in Saskatchewan and the establishment and operation of new nurseries in Ontario, Prince Edward Island, and Nova Scotia. Since 1951 the Federal Government has shared in the planting of 89,852,000 trees, the seeding of 7,636 acres, and the cost of 12 new nurseries.

Forest Fire Protection

Federal financial assistance for fire protection was continued to nine provinces under the five-year agreements executed in 1957. Federal contributions under these agreements are available for capital expenditures on fire prevention, detection, and suppression equipment, buildings and improvements, and the hiring of aircraft and vessels.

The federal allotment in 1958-59 was \$750,000 as compared to \$500,000 for the preceding year. Equal annual allotments of \$1,250,000 are to be made available for the final three years of the agreements. The allotment to each province is dependent upon the province's expenditures on fire protection and also its forested areas.

Aerial Spraying Operations—New Brunswick

The year 1958-59 was the sixth and final year in which the Federal Government, under an agreement with the Province of New Brunswick, contributed to an aerial spraying program designed to combat an extensive spruce budworm infestation. Operations under this program were again conducted by Forest Protection Limited. The Federal and Provincial Governments, and the forest industries in the area, contributed equally to the cost of the operation during the six-year period. In 1958-59, an area of 2,588,000 acres was sprayed, to the cost of which the Federal Government contributed \$452,047.

Investigations by entomologists indicated, late in 1958, that the budworm infestation had collapsed in the sprayed areas. Continued operations in 1959 were not justified. However, in 1959, a serious infestation developed to the south of the sprayed areas indicating a need for spraying some 2½ million acres in 1960. So far the spraying program in New Brunswick has preserved the forest cover on approximately 6 million acres.

Forest Access Roads and Trails

In January of 1958, agreements were entered into with nearly all provinces for the period January 2nd to June 30th, 1958, under the terms of which the Federal Government contributed half the cost of constructing forest

access roads and trails. In the autumn of 1958, similar agreements were again implemented to cover the period November 1st, 1958 to June 30th, 1959.

The access roads and trails constructed under these agreements serve to improve forest fire protection and to aid in the development of the forest resources. The federal contribution to the eight participating provinces under both agreements up to March 31st, 1959, amounted to \$2,698,333.

Forest Management

Forest Inventories on Federal Lands

Because of the tremendous area and the variety of conditions encountered in Northern Canada, Wood Buffalo National Park and the Northern Territories were subdivided into twenty forest management divisions, varying in size from 4,000 to over 100,000 square miles. Forest inventories are to be summarized and forest management planned on this basis.

During the year there was 7,040 square miles of new reconnaissance forest cover mapping and 15,720 square miles of this type of forest cover mapping was planimetered. Detailed forest inventories were completed for 300 square miles. This gives a total to date of 51,700 square miles of completed forest cover mapping in Northern Canada with timber estimates for 31,600 square miles.

A northern field survey party measured 223 one-fifth acre field plots along the Peace River in Wood Buffalo National Park and 288 field plots along the Northwest Territories portion of the Slave River.

Forest surveys were made on twelve small military areas in Eastern Canada. The survey party measured 1,196 field plots.

Camp Gagetown, New Brunswick

The Forestry Branch is responsible for forest fire protection and forest management on the 430-square mile Camp Gagetown Military area. One timber sale was conducted during the year and permits were issued for small quantities of timber and hay. Two small fires occurred in which two acres of non-forested land were burnt.

Other Military Areas

The Forestry Branch supervised one small timber sale at Camp Borden, Ont., and one each at the Woodstock and Gloucester Junction Rifle Ranges in New Brunswick.

Education¹

The main function of the Education Section is the distribution of information stressing the importance of the forests in the national economy and

¹ See Appendix F.

the measures taken to ensure the preservation of this valuable resource. This is performed through correspondence, publications, addresses, films, photographs and displays.

Thirty-nine publications were added to stock and distribution made of 88,000 pieces. Two thousand three hundred inquiries were replied to by individual and form letters.

Forty-eight prints were supplied from the photographic library to illustrate publications of outside organizations and 188 colour transparencies were loaned for inclusion in film strips and the illustration of lectures. A loan service of four fire protection training films was maintained.

Forest fire prevention posters were provided to the Post Office Department for display in post offices across Canada and window exhibits were shown at the Forestry Branch Head Office.

Forest Products Laboratories Division

The past year has been one of considerable importance for the Forest Products Laboratories Division. In April, 1958, both its Laboratories moved into modern buildings which provide more than double the floor space formerly available and greatly improve research facilities. While this move involved some dislocations and interruption of work, the past year, nevertheless, has been one of considerable activity and progress in the research field. It was possible to extend research activities, previously restricted by space limitations. Of special interest were studies on the use of wood as an engineered building material, the application of electronics and ultrasonics to the non-destructive testing of wood and to the manufacture of plywood.

Under active study during the year were some 145 research projects at the Ottawa Laboratory and 55 at the Vancouver Laboratory.

Research into the use of wood in housing construction continued as an important activity of the FPLC. This research was undertaken in close co-operation with the Division of Building Research, National Research Council, and with Central Mortgage and Housing Corporation. For the latter, the FPLC investigated new developments in the use of wood products for housing. DBR and FPLC continued co-operation in bringing an engineering approach to the design of the many wooden components of family dwellings, particularly in the field of panel walls and glued and nailed wooden truss roofs for houses. Important contributions were made to the National Building Code and to Canadian Standards Association Committees.

The past year saw the introduction, by FPLC, of a series of two-day courses on "Improved Sawmilling Techniques" as a means of informing the lumber industry of results of sawmill research undertaken by the Ottawa Laboratory. The first of these courses, which was given in Nova Scotia on

November 5 and 6 last, was arranged in co-operation with the Nova Scotia Department of Lands and Forests, the Nova Scotia Forest Industries Association and the Maritime Lumber Bureau. Similar courses are being arranged on behalf of the lumber industries in Quebec and Ontario.

The FPLC continued to work closely with the forest industries of Canada with special attention being paid to the lumber and wood working industries. Research into the various factors affecting improved utilization continued to receive attention so that fuller and more efficient use can be made of Canadian species. During the past year special studies were made in the field, at logging operations and manufacturing plants of co-operating companies, covering the effect of tree size on lumber manufacture, the relationship between log defects and the cost of lumber produced, and the effect of pre-barking on sawmill operation.

Utilization of sawmill residue for pulpwood continued to show encouraging progress with the annual volume of residue going into pulp having increased six-fold to 15 million cubic feet during the past six years. The Laboratories have been active in this field for a number of years and have carried out extensive research on the barking, chipping and transporting of mill residue. The FPLC is the organizer of, and provides the secretariat for, a committee investigating the problems connected with the utilization of sawmill residue in Eastern Canada.

Important developments were made during the past twelve months in timber physics, a relatively new field of research for the FPLC. Of primary importance was the development of a sonic device for the detection of defective glue bonds in plywood. Applications were made for patents and a licence for the production of commercial models was granted to a Vancouver manufacturer. In the field of non-destructive testing, research was initiated on the development of a method for testing the strength of wood by vibration techniques.

Studies in the plywood and adhesives fields included extensive research required for the preparation of national specifications for adhesives used in the manufacture of a wide range of wood products. Special techniques and tests were developed for the rapid evaluation of the quality and durability of glue bonds in plywood, doors and core stock.

Research was carried out on glued truss rafters for use with glued laminated construction, on special types of timber roof construction and on the strength of power and communication poles. In container research, attention was given to improving the efficiency of wood-based container materials, particularly in the packing of poultry and eggs. Projects included the development of a performance test for poultry boxes and research covering suitable methods for the testing of fibreboard containers for use in the storage and shipment of eggs. Special attention was paid to the durability of exterior coatings and natural finishes and on the adherent qualities of paints when applied to wood, including the causes of blistering.

Promising results were obtained in laboratory scale experiments on the chemical utilization of wood residues for the pulping of sawdust and other comminuted wood material, using gases dissolved in organic solvents. The technique permits the production of satisfactory pulps in good yield and in short pulping cycles.

The staff continued active on numerous committees which included those of the National Building Code, Canadian Standards Association, Canadian Government Specifications Board, American Society for Testing Materials, Food and Agriculture Organization of the United Nations, as well as technical committees on lumber, plywood, furniture, wood preservatives, railway ties, and pulp and paper. Assistance was also given in the form of laboratory work and technical analyses to the Department of National Defence, Department of Agriculture and a number of Crown Agencies.

The dissemination of research findings continued to be a matter of utmost importance at both Laboratories. During the past year technical information was supplied by the FPLC in response to over 3,000 inquiries received by mail or resulting from personal visits by manufacturers and users of all forms of forest products. In addition, some 36,000 FPLC publications¹ were distributed, 36 articles published in various trade and technical journals and 30 talks and lectures delivered by the staff to industry and to the general public. Several reports and articles emanating from the FPLC were re-published in foreign countries.

Exhibits illustrating the properties of wood and portraying the results of research were prepared for meetings in Ottawa and Montreal. Co-operation was given the Maritime Lumber Bureau in the preparation of its exhibit for the Trade Fairs in the British West Indies. In addition, 6,376 samples of Canadian timber species were sold to the general public.

Advisory committees of industries, with their technical sub-committees, continued to assist both Laboratories in assessing the program of research work in relation to the needs of industry. Such committees, with members representing various timber producing and wood using groups, permit discussions of trends and reviews of technical advances, thereby clarifying the needs of the national economy, of industry, and of the consumer. On an international basis, close and friendly liaison continued with the forest products research institutions in other lands, so that through the exchange of research data, Canadian interests may be better served.

¹ Appendix F shows list of publications issued during the year.

National Museum of Canada—Natural History Branch

This Branch is concerned with the collection, study, preservation and display of material illustrating the geology and botany of Canada. Its scientists study minerals, rocks, fossils, plants and animals.

Eleven field parties were sent out and returned with specimens and valuable scientific information from many parts of Canada. Research was pursued in many areas of botany, zoology, and vertebrate palaeontology and the results of this research published in *Bulletins of the National Museum* and in scientific journals.¹

The Director visited natural history museums at London, Edinburgh, Brussels and Paris to effect greater co-operation between the Natural History Branch and its European counterparts. These visits have encouraged closer relations between the museums and more contributions of information and specimens by direct exchange. While in Europe the Director presented papers to the (British) Museums Association and the International Zoological Congress.

The staff was busy planning new and improved exhibits which will become possible as more exhibit space is made available. It is proposed to establish new Halls of Geology, Palaeontology and Mammalogy which will present exhibits of significant interest to the Canadian public. Two temporary exhibits were set up in the main lobby of the National Museum building, one featuring sea shells and the other Canadian fishes.

Botany

Three botanical parties were in the field during 1958. One ranged the Rocky Mountains of Alberta and British Columbia studying the alpine floras of Banff and Jasper National Parks in preparation for a manual of Rocky Mountain floras. The second continued research on the Atlantic seaboard for a study on the floras of that region, and visited northern Manitoba to prepare for the Churchill tour of the IX International Botanical Congress. The third conducted field research in the Winisk, Ontario, area of the Hudson Bay Lowland, then moved to the Boreal Forest region of Quebec and Ontario to prepare for the Boreal Forest tour of the Botanical Congress.

The botanists were engaged actively in preparations for the Botanical Congress, which will be held in Canada during the summer of 1959. Each botanist will act as a guide on a tour of a particular region, providing the visiting botanists with the benefit of his specialized knowledge of the floras of that region. These duties involved the preparation of guide books on the tours to the Rocky Mountains, Churchill and Boreal Forest regions and advance reconnaissance of the areas that will be toured.

¹See Appendix F.

The Chief Botanist, who last year studied the plants of northern Europe and Asia under a Guggenheim grant, mailed 100 botanical reprints and books to Russian botanists in return for Russian botanical literature he had received during his visit to Leningrad. He also selected a set of 525 Arctic plants for exchange with the Herbarium of the U.S.S.R. Academy of Sciences at Leningrad.

During the year 6,170 herbarium specimens were received by exchange, 723 by donation, and approximately 7,387 resulted from field work or were obtained in exchange for determination by members of the National Museum staff. Specimens numbering 2,952 were sent on loan to other botanical institutions, and 415 were borrowed from them. Duplicate specimens, 1,836 in number, resulting from field work of the herbarium staff, were distributed to Canadian and foreign herbaria in continuation of exchange. A total of 5,396 specimens of vascular plants were mounted and inserted in the herbarium, bringing the total number of mounted vascular plants in the National Collection to 254,726 and 8,116 specimens of cryptogamic plants were packeted and inserted into the herbarium. Type specimens numbering 50 were collated and indexed, bringing the number of indexed types of vascular plants in the herbarium to 1,811. The herbarium collection was used by 87 Canadian and foreign botanists.

Zoology

Eight field parties carried out research and collected specimens in various parts of Canada. Parties collected birds in the Mackenzie River Valley of the Northwest Territories and the Ungava district of Quebec, small mammals in the Eastern Townships of Quebec and in southern Ontario, mammals on Vancouver Island and smaller islands of Georgia Strait, birds and mammals on Prince of Wales Island, N.W.T. and amphibians and reptiles on Prince Edward Island and Cape Breton Island. A study was made of the distribution and ecology of the seashore invertebrates of the Atlantic Provinces.

Studies are in progress on the caribou, on the Talitridae of the world and the amphipod genus *Gammarus*. The manuscript of "Canadian Atlantic Seashells" was completed and progress achieved on the books "Mammals of Canada" and "Birds of Canada". The collection of fishes was sorted and identified and a checklist of Canadian marine fishes prepared.

A biologist served as an expert witness at the hearing of a charge laid under the Migratory Birds Convention Act at Sorel, P.Q., identifying the live Canada geese that were exhibits in the trial as wild birds.

Advice was given to the National Parks Branch on the improvement of natural history museums at Riding Mountain and Banff National Parks.

During the year the following additions were made to the zoology collections: 12,250 invertebrates, 1,669 birds, 1,336 mammals, 3,265 reptiles and amphibians and 318 fishes. The numbers of specimens in the various

collections at the end of the fiscal year were: invertebrates, 190,000; birds, 44,000; mammals, 25,500; reptiles and amphibians, 15,000; and fishes, 2,500. Schools were loaned 275 birds and mammals for teaching purposes.

Palaeontology

Field work was carried out in southern Alberta between May and August. A party of three palaeontologists collected fossil vertebrate specimens in Upper Cretaceous rocks near Manyberries and a skeleton of the horned dinosaur *Chasmosaurus* south of Irvine. A small collection was made from the Foremost formation.

The Chief Palaeontologist also inspected a reported Triassic vertebrate occurrence in Nova Scotia in December and, while on annual leave in Texas, collected at his own expense part of a skeleton of the Permian pelysosaur *Dimetrodon* and a small representative group of other Permian vertebrates.

A study of a dinosaur ichnite from the St. Mary River formation of Alberta and the preparation of a monograph on the Tertiary crocodiles of South America were advanced during the year. Manuscripts on "Anchiceratops from the Oldman Formation of Alberta", and "Alberta and Fossil Vertebrates" were completed and submitted for publication.

The Vertebrate Palaeontological Laboratory was actively engaged in planning the new Fossil Vertebrate Hall, renovating and improving present palaeontological exhibits and preparing skeletons for exhibition. The *Chasmosaurus* skeleton group on exhibit was renovated. A *Gorgosaurus* skeleton was prepared for reconstruction and mounting and work started on the preparation of a *Hypocrossaurus* skeleton and the reconstruction of a plesiosaur skeleton.

There are now 4,711 catalogued specimens in the collection of vertebrate fossils plus many more that have not yet been unpacked and catalogued.

National Museum of Canada—Human History Branch

This Branch collects and preserves artifacts and records of the prehistoric, aboriginal and immigrant peoples of Canada. The physical characteristics, culture, folklore, society and languages of those diverse ethnic components that have contributed to the Canadian nationality are studied and the results of this research embodied in reports, papers, publications and exhibits. The Human History Branch is concerned with the study of man-anthropology in its widest sense.

The Canadian War Museum was added to the Branch on April 1. There was no change in the staff, location and policy of this museum as a result of its transfer.

Two temporary exhibits were placed in the main lobby of the Museum. One presented Indian birchbark work, the other artifacts from the three cultural levels of the Eskimos.

Archaeological field work was carried out along the coast of the Yukon Territory, in the Ungava district of Quebec, in Ontario and on Vancouver Island. The addition of a physical anthropologist to the scientific staff greatly stimulated the scientific work of the Branch and made possible studies that had not been previously possible. Ethnological research was carried out in many parts of Canada and much valuable material on folklore and folk-songs collected and classified.

Archaeology

A 66-day archaeological reconnaissance of the Firth River was carried out, yielding 419 bone or stone tools, about 1,000 potsherds, about 650 fragments of bone and seven pollen samples.

Study of these specimens indicates that the people of the Flint Creek culture date from 8,000 to 12,000 years ago rather than from 6,000 to 8,000 years ago as was previously estimated.

Studies on the origin and development of the Cape Dorset Eskimo culture continued at Sugluk, Ivugivik and Mansel Island. About 5,200 specimens were collected, including the oldest Eskimo bone ever found, a mandible believed to date from 500 B.C.

A study of skeletal remains from Manitoba was commenced by the physical anthropologist while the other physical anthropology project on the blood groups of the Metis and other ethnic groups of Western Canada continued in Saskatchewan and Manitoba.

Other archaeological work was carried out in the Kingston area of Ontario, at Flin Flon, Manitoba, and the Churchill River area, on Manitoulin Island and in northern Ontario and at the midden area of Courtenay, B.C.

The senior Archaeologist spent four weeks leave on archaeological research in Mexico. This work, carried out at his own expense, involved the excavation of a cave containing the earliest remains of Maya culture in Chiapas State.

Plans for new exhibits on archaeology and the Canadian Eskimo were completed and planning and assembly of materials for an exhibit on the "Evolution and Races of Man" commenced.

Ethnology

Research was carried out in numerous ethnological fields. An ethnologist continued anthropological studies of Canadian Eskimos at Povungnituk. Four successive levels of acculturation were discovered among the Eskimos of this region, each level with its own technology, social organization, white-Eskimo interaction and migratory pattern. Six tapes of linguistic material were recorded and 20 tapes of folk tales and folk songs. About 100 traditional artifacts were collected as well as substantial collection of carvings illustrating the traditions of the Povungnituk Eskimos. A group of weapons used for hunting seals at their breathing-holes was acquired from Pelly Bay.

Two temporary exhibits were displayed in the main lobby of the building. These were "The Changing Eskimo", a visual presentation of artifacts from three cultural levels of the Eskimos, and the exhibit displaying the traditional use of birch bark by the Indians of Canada.

Folklore investigations continued in Nova Scotia, New Brunswick, the English-speaking settlements of the Magdalen Islands, the north shore of the St. Lawrence River, Acadian villages in the Atlantic Provinces, and Newfoundland. Research on the Hare Indians of the Colville area of the Mackenzie District, N.W.T. was conducted with the participation of Carleton University.

Re-organization and enrichment of the collection of recorded folk songs continued. All of the 7,090 wax cylinder recordings are being transferred to tape and at the year's end 3,790 recordings had been transferred.

A collection of 100 Indian, Eskimo and early French-Canadian artifacts was donated by Dr. Jacques Rousseau and other collections of artifacts were donated by Richard Ray, George Fensom, Miss Juliette Gauthier, S.C. Ells, and Duggan Gray. A Mohawk lexicon bequeathed to Dr. Marius Barbeau by the late Charles A. Cooke, archivist of the Indian Affairs Branch of the Department of Citizenship and Immigration, was donated by Dr. Barbeau.

Various artifacts were loaned to Crawley Films Ltd. for the production of a television series on the R.C.M.P. and assistance given to the setting up of a Canadian exhibit at Neuchâtel, Switzerland. Forty-eight Eskimo carvings were purchased for the National Museum collection and an inventory maintained of all Eskimo carvings purchased by the Northern Administration Branch.

Canadian War Museum

This Museum, which is devoted to the preservation and care of relics relating to Canada's military history, was transferred to the Human History Branch on April 1, 1958.

Considerable effort was made to rotate the material on display during the year. Two special exhibits were arranged, one dealing with the relics and effects of the three Canadian pilots who won the Victoria Cross during the First Great War and the second presenting interesting specimens relating to the history of Canadian military aviation. This second exhibit, which included a fine specimen of a B.E. 2C biplane of the First Great War, was presented to observe the 50th Anniversary of Powered Flight in Canada.

The museum continued to attract great interest among the Canadian public. A total of 127,531 visitors was recorded, many of these groups from schools who were visiting the museum while on conducted tours of Ottawa institutions. Many inquiries on Canadian military history from high school and university students were answered.

Common Services

Four sections provide common services in support of the scientific, educational and exhibition functions of both the Natural History and Human History Branches.

The Mechanical Services Section, which carries out all the electrical and mechanical maintenance of the buildings and constructs and renovates exhibits, built and set up four temporary exhibits during the year and acted as a technical consultant on the planning for new and improved exhibits and the general enlargement of the branches' office and display space.

The Library, which has shared its collection of books with the Geological Survey of Canada, commenced re-organization as a distinct National Museum Library. A committee of representatives from the Geological Survey of Canada and the National Museum began the distribution of books and journals between the two organizations. About 30,000 volumes have been retained by the National Museum Library and 499 new books were added.

The Education Section continued to encourage public interest in the scientific activities of the Museum through lectures, conducted tours, the loan of films, photographs and specimens to schools, and special programs. Twenty-two adult lectures in English were presented to audiences, totalling 8,665 and four lectures in French to a total audience of 337.¹ The popular "Canada in Colour" film series was repeated during the summer with the cooperation of the National Film Board, providing enjoyment to 5,548 persons.

¹ See Appendix E.

The lecture hall of the National Museum continued to be used by educational and other organizations who availed themselves of its facilities for projecting films and slides and accommodating sizable numbers of the people.

Conducted tours were provided for 117 groups, mainly from schools, and 18 special children's film programs presented on Saturday mornings to audiences totalling 17,886, a 100 per cent increase in attendance. As a service to Museum visitors, a sales desk was operated in the main lobby; sales of books, pamphlets, postcards and Eskimo stone carvings amounted to \$3,123. Schools were loaned 88 films, six film strips and numerous anthropological specimens. A great number of inquiries for general information were received by telephone and letter. Arrangements were made to move the 261 reels of 35 mm. documentary film taken by the National Museum to the National Film Board storage vault at Pendleton, Ont.

The Photographic Section completed 3,445 items of photographic work of which 2,351 were contact prints.

Canadian Government Travel Bureau

The Canadian Government Travel Bureau was established in 1934 "to assist in promoting tourist business in Canada". Since that time it has been the federal agency responsibility for the encouragement of tourist travel to Canada, with particular emphasis on attracting visitors from the United States.

Each year the Bureau carries out extensive newspaper and magazine advertising campaigns in the United States on behalf of Canadian travel; provides a detailed travel counselling and referral service for prospective visitors; produces travel literature and other informational material and carries out its distribution as well as literature provided by provincial tourist organizations, transportation companies and other agencies. The Bureau maintains, in co-operation with the National Film Board of Canada, a chain of 16 mm. sound and colour travel film libraries in the United States; and conducts publicity programs in the United States, Canada and abroad on behalf of travel to Canada.

The Bureau's Ottawa staff of up to 84 persons (including seasonal employees) occupies offices on the first and second floors of the Kent Building in downtown Ottawa and branch information offices have been established in New York City and Chicago. In April, the Bureau's Chicago office was moved to a new and more central location in ground floor offices at 102 West Monroe Street, in that city, and in October, the New York office was formally opened in its new location in Canada House on Fifth Avenue.

On December 3 and 4, the Thirteenth Federal-Provincial Tourist Conference was held in Ottawa with delegates from federal departments, provincial tourist organizations, transportation companies and the Canadian Tourist Association attending. The Conference examined the results of the 1958 tourist year and concluded that while there had been a slight setback in United States tourist traffic because of uncertain economic conditions and other factors, increased inter-provincial travel had kept Canada's tourist business on a par with the previous season.

Travel expenditures in Canada by travellers from other countries totalled \$352 million of which \$309 million came from United States visitors. This was five per cent lower than the 1957 record year. Receipts from other countries, however, set a new high of \$43 million, an increase of \$5 million over the previous year. In the meantime Canadians spent \$411 million on travel in the United States and \$133 million in other countries. There were 28,530,700 individual entries into Canada in 1958. The National Parks of Canada played host to 4,948,910 visitors during the calendar year, an increase of 452,087.

For the 1958-59 season the Bureau allocated \$1,400,000 for advertising in United States magazines and newspapers. Of this amount approximately \$800,000 was used for a general magazine campaign, \$300,000 for

a general newspaper campaign (including production charges) and \$300,000 for a special Atlantic Provinces campaign. During the year, by judicious selection of advertising markets, the Bureau was able to gain $3\frac{1}{2}$ million in circulation and add 6 magazines to its list, using relatively the same amount of money—with some allowance for increased cost of space and production. The 1958 general campaign ran in 42 different magazines with a total circulation of 58,476,543, and in 72 different daily newspapers with a total circulation of 28,691,212. Advertising for the Atlantic Provinces was placed in six magazines with a combined circulation of 19,493,234, and in 26 newspapers with a total circulation of more than $14\frac{1}{2}$ million.

Travel Counselling

As a result of this extensive advertising campaign, the Bureau serviced a record 756,987 requests for Canadian travel information. Of this total, approximately 658,988 were serviced from Ottawa, 60,816 by the New York Office, 18,221 by the Chicago Office, and 18,962 by Canadian Consulates in the United States.

Of the 658,988 inquiries serviced from Ottawa, 263,747 were requests for detailed information on travel in Canada, which required special attention by the Travel Counselling Section. These requests are serviced with appropriate material from Ottawa and are then referred via the Bureau's special referral system to provincial and local bureaus across the country as well as to all main transportation companies so that they may follow up with additional assistance.

A total of 20,218 inquiries were given personally dictated replies by the Bureau's Travel Counselling staff. The increase in detailed inquiries clearly indicates that more and more prospective visitors are demanding this type of specialized information to help them plan their vacations in Canada.

Publications

A total of some 5,000,000 of the Bureau's publications and leaflets were distributed in 1958, with large runs for such principal items as *Canada-Vacations Unlimited*, both booklet and folder; *Canada-United States Highway Map* and *How to Enter Canada*. All existing service booklets were brought up-to-date by the Travel Counselling Section, and some additional ones were produced including a new service booklet on the Trans-Canada Highway and another entitled *Where to Fish in Canada*.

Wide distribution of a leaflet and poster suggesting exchange of American dollars at Canadian banks was made through border crossing points, Canadian Chambers of Commerce, transportation companies, and provincial and local tourist associations. Similar distribution of a special poster regarding Customs exemptions on purchases by U.S. residents was also carried out.

In addition to the large volume of material sent out in reply to individual requests from prospective visitors, a large percentage of the Bureau's literature and maps was distributed through such important travel outlets in the

United States as automobile clubs, travel agencies, transportation companies, personnel departments of industrial organizations, chambers of commerce, gasoline and oil companies' touring bureaus, and to a lesser extent in other foreign countries.

Promotional mailings of literature encouraging distribution to prospective visitors were carried out early in the year to well over 6,500 contacts.

To assist in promoting attendance at various conventions in Canada and to encourage as well pre- or post-convention travel, the Publications Section carried out special mailings of material to prospective delegates.

Publicity

The Bureau's publicity programs in the United States, in Canada, and in overseas countries included the regular mailings of release material to more than 2,200 media. In addition, mailings of 10,087 glossy prints in black and white and the loan of 2,111 colour transparencies to magazines and rotogravure sections showed a sharp increase over the previous year. The Bureau carries out few unsolicited mailings of photo material and over 90 per cent of the photos are distributed as the result of direct requests. Publicity service during the year was expanded, for special travel sections of major United States newspapers, to include the offer of many special feature stories on vacationing in Canada. The articles were offered on an exclusive basis to editors and were especially written and slanted to each newspaper and its readers. They provided a very wide additional coverage to the Travel Bureau's publicity campaign.

Besides making direct placements of Canadian travel publicity, the Bureau helped many editors in the United States and overseas countries develop their own Canadian travel stories.

During July and August, picture-taking assignments were carried out for the Travel Bureau by a National Film Board of Canada photographer, and by four private photographers. The program included coverage in New Brunswick, Prince Edward Island, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. They provided a good new selection of black and white and colour still photos for advertising, publicity and publications use.

In 1958 Canadian travel films continued to promote visits to Canada through direct showings to community groups and over television. The program now includes approximately 485 outlets in the United States—160 deposit outlets and 325 circuit points—organized and serviced by National Film Board offices in New York and Chicago.

In February, 1958 an advisory committee, representing sponsors of travel films, was set up to discuss plans for new productions in line with the needs of the Canadian Travel and Wild Life Film Program. A sub-committee to evaluate new films has functioned regularly since that date. New outlets and circuits have been organized, and a special study completed on

the comparative importance of each State in relation to travel potential to Canada. The Travel Bureau purchased nearly 800 prints of some 175 titles in 1958.

During the year 4,126,387 persons saw Canadian Travel Films through 70,940 direct showings. This represented an attendance increase of 14 per cent over the previous year.

There has been a moderate but steady increase of the number of telecasts since the establishment of a free television library at New York in 1954. In 1958 an estimated audience of 60 million people was reached through 1,835 telecasts (277 of which were in colour) over 126 stations in 102 cities covering 38 States.

A series of 10 "televisit" subjects (2-4 minute Canadian vignettes) were released in June of 1958 and during a four-month period—June to September—were telecast 568 times over 26 stations in 26 cities covering 16 States.

The new NFB 56-minute film *Trans-Canada Summer* was telecast on the ABC network in two parts on August 29 and September 5 from 9:00 to 9:30 p.m. Thirty-two stations used this particular network program and according to an estimate based on Neilson data, some 5 to 10 million people viewed this particular program.

Administration Services Branch

During the year under review, administrative assistance was provided to the Deputy Minister and to the operating Branches by the office of the Chief Administrative Officer and the various administrative divisions.

Economic Division

The primary function of the Economic Division is to carry out economic research and to provide advice on economic questions relating to the Department's role in administering and developing the northern territories, and in the management of resources generally.

During the past year the staff of the Division provided economic advice on the Roads to Resources program and made detailed studies of certain roads being considered for inclusion in the program. It also concerned itself with questions relating to minerals and energy fuels, transportation, resource processing, territorial revenues and expenditures, tourist development, and economic growth prospects for communities in the north. Among the specific studies carried out were analyses of the proposed railroad to Great Slave Lake, hydro-electric power in Newfoundland, transportation on the Mackenzie waterway, and the economic potential of Frobisher Bay. The Division also participated in negotiations concerned with the transfer of the Canol pipelines and related facilities from the United States to Canada.

The Division provided consultation on matters of policy as well as of substance and members of its staff represented the Department on a number of interdepartmental and special committees which met during the year.

Editorial and Information Division

Assistance and advice on most aspects of public information were offered to all branches of the Department during the year. As its name implies, this Division has a double function: it provides a complete editorial service for the Department and also acts as an information agency which collects, processes and distributes material of general public interest.

A total of 156 departmental publications—the majority of a technical nature—were produced during the fiscal year. Editorial and Information made arrangements for printing and carried out subsequent liaison with the Queen's Printer for all these publications and for many the Division provided a complete editorial service to the various branches. A total of 293 articles were also edited. Thirty-five publications in the French language were edited as well as the translation of press releases and speeches.

Information activities included the preparation of 107 press releases, the distribution of 750 black-and-white photos of the Northwest Territories and the Yukon Territory, and the writing of 35 articles, radio scripts and

speeches. Drafts were written for booklets on Inuvik, the Canadian Wildlife Service, Batoche Rectory National Historic Park and the Canadian War Museum. Five chapters were written for "Landmarks of Canada's Past", a guide-book to Canada's history and historic sites. Information was collected and prepared for use in special editions of newspapers and magazines and for Canadian, United States and British encyclopedias and year-books.

Special exhibits were presented at the Pacific National Exposition at Vancouver and the Quebec Provincial Exhibition at Quebec City. The Vancouver exhibit, which featured Eskimo life and customs, attracted 165,000 spectators while the Quebec City exhibit, which presented visual material on historic sites, drew an estimated 150,000 spectators. Short-term exhibits were also presented. The Division continued to co-ordinate travelling exhibits of Eskimo carvings in the United States, South America and Europe.

Mail inquiries for information totalled 15,148 and 39,555 mimeographed information pieces were mailed in response to these requests. Many reports, statements, speeches and other documents were stencilled and mimeographed for departmental use or public distribution; in all, more than 4,000 stencils were cut and 500,000 pages run through the mimeograph machine.

Legal Division

Legal advice on matters coming within the responsibility of the Department was offered during the year. The Division provides a complete legal consultative service, representing the Department in litigation and advising on the legal implications of departmental policies, acts and regulations.

Special advice was given on the drafting of various contracts, agreements, legislation and regulations and counsel was provided to the Councils of the Yukon Territory and the Northwest Territories.

Personnel Division

The Personnel Division is responsible for planning and executing the departmental personnel policy and provides an advisory service on personnel administration. Records designed to produce a variety of information affecting staff are maintained. Specialized services are provided in the field of establishment and classification, staff training and employee welfare.

Members of the Personnel Division take an active part in the selection of candidates for promotion and during the year 102 competitions were held in the department and 244 separations of full-time employees occurred. During the fiscal year, total departmental establishment of full-time positions was 2,390, an increase of 249 from the previous year. In addition to full-time employees the department also employed a substantial number of seasonal and part-time persons. Staff are located in every province of Canada and both northern territories.

Purchasing Division

The Purchasing Division is responsible for procuring all supplies and equipment needed by the Department. Its officers represent the Department in dealing with suppliers and investigate equipment and supplies on the market to see if they are acceptable for the general and specific requirements of the Department.

During the fiscal year the volume of purchasing increased to a level higher than any previous year. The Division received 15,295 requisitions and issued 13,189 purchase orders. The proportion of procurement to total departmental expenditure continued to increase; in 1958-59, procurement made up 62 per cent of total departmental expenditure. This yearly increase in procurement has been evident since 1954-55 when procurement accounted for 42.7 per cent of the total departmental expenditure. In the past dozen years, procurement has increased five-fold.

Reorganization of purchasing procedures continued. A start was made on the bulk purchasing of supplies and equipment whose use is common to all branches, such as petroleum products, asphalt, tires and tubes, paint, and clothing. The use of Canadian Government specifications enabled the Division to achieve a greater degree of standardization and uniform quality. Such bulk purchasing has proved very satisfactory, providing greater economy and more efficient delivery.

The Division continued to help co-ordinate supply operations in Northern Canada. For the first time petroleum products were shipped to Frobisher Bay by tanker and pumped into storage tanks from which distribution could be made. One hundred and fifteen pre-fabricated housing units were purchased by tender and shipped north. Contracts were made with Yellowknife suppliers to provide a year's supply of food to the Yellowknife Hostel, which is administered by the Department. The furnishing of territorial schools and the homes of northern teachers continued to be a major activity. Purchase and shipment of food for departmental staff living in the Northwest Territories was carried out under a system by which the field staff repays the cost in monthly instalments.

Vehicle and machinery purchases included cars and trucks as well as road construction and maintenance equipment, electric generators, boats, and special tracked vehicles for use over snow and muskeg. A "Rat" tracked vehicle was purchased for use at Fort Norman, N.W.T., and is being evaluated as a possible general-purpose vehicle for northern transportation over difficult terrain.

The Division represented the department on the Canadian Government Specifications Board. Its officers participated in drawing up specifications for sleeping bags, summer uniforms for park wardens, residential and school furniture, tents, blankets, bedding, trailers and other articles.

Northern Research Co-ordination Centre

Under the Department of Northern Affairs and National Resources Act, assented to on 16 December, 1953, the Minister of Northern Affairs and National Resources was made responsible for fostering through scientific investigation and technology, knowledge of the Canadian north and of the means of dealing with conditions related to its further development. To assist in carrying out this responsibility a small Northern Research Co-ordination Centre was established in 1954, reporting through the Secretary of the Advisory Committee on Northern Development.

The terms of reference of the Northern Research Co-ordination Centre are: to collect and disseminate technical and scientific information on the north, to co-ordinate departmental and interdepartmental research in the north, to sponsor and conduct research on northern subjects in fields for which no other government agency is responsible or which are concerned with a number of different fields; to encourage government and non-government agencies to undertake research in the north, to assist in planning projects for northern development, especially those affecting the Eskimos, to arrange for the working up and publication of materials and results of expeditions in Northern Canada which have not been adequately published, and to handle the issue of Scientists and Explorers Licences and Permits to archaeologists for the Northwest Territories.

The Centre keeps in touch with arctic research carried out both in Canada and other countries and conducts research, especially in the field of social anthropology, with seasonal employees, and by means of contracts and grants-in-aid. The Northern Affairs Library, which is part of the Northern Research Co-ordination Centre, provides library services for the Northern Administration Branch as well as the Research Centre and handles an increasing number of technical and scientific inquiries. There are 4,203 books and 171 periodicals in the library. During the year 1,713 loans were made, 1,128 inquiries answered and 3,216 periodicals circulated.

As part of its co-ordinating function, the Centre provides the secretariat for two research committees. One of these is the Scientific Research Sub-Committee of the Advisory Committee on Northern Development, which co-ordinates government research at the interdepartmental level, and the other is the departmental Northern Research Committee co-ordinating northern research within the department.

Eleven research projects were undertaken in 1958 including eight Social Anthropology studies, two in Biology, and one in Physics. This made a total of twenty-seven projects carried out in the past four years.

The main anthropological research projects were undertaken in five Eskimo communities by seasonal employees and university scientists. Their object was to determine the degree of Eskimos adjustment to changed social and economic circumstances at Rankin Inlet, Coppermine, Frobisher Bay,

Port Harrison, and Camp 20 at Fort Churchill. The information thus gained was of value in determining Eskimo employment policies and the role the government might play in the social and economic development of each community.

One grant supported a study on nutrition and growth rates of reindeer fawns and the effect of lactation in reindeer cows at the Reindeer Station near Aklavik. Another allowed a botanist to accompany the Defence Research Board expedition to Lake Hazen, Ellesmere Island to collect flora and study muskox range conditions. A contract was arranged for an investigation of the feasibility of using heat pumps as a source of domestic heat in the north, and a comparative study covering the use of a diesel unit, equipped with conventional devices to recover heat, but without the heat pump element to generate light, power, and heat.

Several research projects begun in 1956 and 1957 were completed in 1958. These included preparation of a draft Eskimo orthography, an examination of the possibility of assessing caribou range conditions by aerial photography, a study of legal concepts among the Netsilik Eskimos, and a social and economic study of the community at Tuktoyaktuk.

APPENDICES

Appendix A

Summary of Revenues and Expenditures, 1958-59

	Revenues	Expenditures
ADMINISTRATION SERVICES.....	\$ 242.75	\$ 739,910.00
Contributions to the Provinces for Camp-ground and Picnic Area Developments.....		1,723,436.49
NORTHERN RESEARCH CO-ORDINATION CENTRE.....		85,968.14
NATIONAL PARKS BRANCH		
Branch Administration.....		139,151.18
National Parks and Historic Sites.....	2,189,055.85	21,950,399.14
Grant to Jack Miner Migratory Bird Foundation.....		5,000.00
Grant in aid of the development of the International Peace Garden in Manitoba.....		14,841.56
Grant to the City of Orillia.....		15,000.00
National Battlefields Commission.....		178,625.00
Canadian Wildlife Service.....	1,834.56	592,409.07
	2,190,890.41	22,895,425.95
WATER RESOURCES BRANCH.....	126,831.96	2,379,822.09
NORTHERN ADMINISTRATION BRANCH		
Branch Administration.....	243,366.03	1,223,926.98
Yukon Territory.....	1,800,017.18	3,854,608.86
Northwest Territories.....	7,570,099.16	20,504,150.43
Roads to Resources.....		1,750,732.79
	9,613,482.37	27,333,419.06
FORESTRY BRANCH		
Branch Administration.....		143,145.86
Forest Research Division.....	78,150.83	1,480,508.85
Forestry Operations Division.....	13,307.96	4,620,921.13
Forest Products Laboratories Division.....	4,706.99	973,352.47
Grant to Canadian Forestry Association.....		20,000.00
Eastern Rockies Forest Conservation Board.....		5,445.60
	96,165.78	7,243,373.91
NATIONAL MUSEUM OF CANADA.....	2,412.12	569,347.46
CANADIAN GOVERNMENT TRAVEL BUREAU.....	4,067.34	2,206,129.32
TOTALS FOR DEPARTMENT.....	\$12,034,092.73	\$65,176,832.42

Appendix B

1. Mineral Production

	1957		1958 ¹	
	Quantity	Value	Quantity	Value
NORTHWEST TERRITORIES				
		\$		\$
Gold.....	340,018 oz.	11,407,604	335,720 oz.	11,392,475
Silver.....	69,104 oz.	60,376	73,355 oz.	63,723
Copper.....	330,472 lbs.	95,672	906,000 lbs.	230,395
Nickel.....	1,056,341 lbs.	734,157	4,233,000 lbs.	2,994,848
Uranium.....	838,264 lbs.	8,801,769	964,000 lbs.	9,628,000
Petroleum.....	420,844 bbls.	294,591	471,000 bbls.	475,000
Natural Gas.....	19,243 M. cu. ft.	6,446	21,500 M. cu. ft.	7,075
TOTAL.....	—	21,400,615		24,791,516
YUKON TERRITORY				
		\$		\$
Gold.....	73,962 oz.	2,481,425	69,210 oz.	2,351,756
Silver.....	6,484,185 oz.	5,665,232	5,860,499 oz.	5,091,015
Lead.....	24,985,839 lbs.	3,488,023	21,589,447 lbs.	2,446,084
Zinc.....	17,119,445 lbs.	2,069,741	14,527,390 lbs.	1,577,675
Cadmium.....	185,754 lbs.	315,782	162,706 lbs.	247,313
Coal.....	7,731 tons	91,595	4,544 tons	58,975
TOTAL.....		14,111,798		11,772,818

¹Preliminary figures.2. Timber Permits Issued and Volume of Timber Cut,
Yukon and Northwest Territories

Type of Permit	Yukon Territory				Northwest Territories ¹			
	Permits Issued	Lumber (ft.b.m.)	Round Timber (lin. ft.)	Fuel- wood (cords)	Permits Issued	Lumber (ft.b.m.)	Round Timber (lin. ft.)	Fuel- wood (cords)
Commercial per- mits.....	27	2,653,260	1,097,298	1,232	18	12,402,323	170,975	3,594
Free of fees and dues.....	11	—	300	440	8	—	11,440	183
Free of dues.....	15	—	2,000	900	11	—	14,000	1,016
Dues paid.....	176	25,000	75,805	2,955	115	47,000	132,120	3,021
TOTAL....	229	2,678,260	1,175,403	5,527	152	12,449,323	328,535	7,814

¹Includes Wood Buffalo National Park.

3. Revenue

	Northwest Territories		Yukon		Provinces		Totals ¹	
	\$	cts.	\$	cts.	\$	cts.	\$	cts.
Mining.....	142,403	87	110,476	75	—		252,880	62
Oil and Gas.....	6,634,330	75	1,548,315	14	201,138	25	8,383,784	14
Lands, Timber and Grazing.....	101,310	27	44,752	61	63,517	20	209,580	08
TOTALS.....	6,878,044	89	1,703,544	50	264,655	45	8,846,244	84

¹All royalty statements had not been received at the end of the fiscal year.

4. School, Location, and Attendance

MACKENZIE EDUCATION DISTRICT			Status and Number of Pupils Enrolled as of March 31, 1959			
School	Location	No. of Teachers	Eskimo	Indian	Others	Total
Aklavik.....	Aklavik.....	7	54	50	65	169
All Saints Ang. Residential.	Aklavik.....	5	74	10	5	89
All Saints Ang. Hosp.....	Aklavik.....	1	16	4	0	20
Arctic Red River.....	Arctic Red River.....	1	0	13	0	13
Cambridge Bay.....	Cambridge Bay.....	2	41	0	0	41
Coppermine.....	Coppermine.....	2	32	0	4	36
Discovery Mine.....	Yellowknife.....	1	0	0	13	13
Feraud's R.C. Hosp.....	Fort Rae.....	1	0	3	0	3
Fort Franklin.....	Fort Franklin.....	2	0	50	3	53
Fort Good Hope.....	Fort Good Hope.....	2	0	58	15	73
Fort Liard.....	Fort Liard.....	1	0	17	5	22
Fort McPherson.....	Fort McPherson.....	6	0	110	31	141
Fort Norman.....	Fort Norman.....	2	0	16	33	49
Fort Rae.....	Fort Rae.....	2	0	44	10	54
Fort Resolution.....	Fort Resolution.....	5	0	16	83	99
Fort Simpson.....	Fort Simpson.....	4	0	49	45	94
Fort Smith.....	Fort Smith.....	21	0	198	299	497
Fort Wrigley.....	Fort Wrigley.....	1	0	23	0	23
Hay River.....	Hay River.....	11	0	29	211	240
Immaculate Conception R.C. Residential.	Aklavik.....	7	92	27	53	172
Immaculate Conception R.C. Hospital.....	Aklavik.....	1	6	3	2	11
Inuvik.....	Inuvik.....	3	18	9	30	57
Jean Marie River.....	Jean Marie River.....	1	0	21	0	21
Lac La Martre.....	Lac La Martre.....	1	0	17	3	20
Norman Wells Mine.....	Norman Wells.....	1	0	1	9	10
Old Crow.....	Old Crow (YT).....	1	0	0	39	39
Port Radium Mine.....	Port Radium.....	1	0	2	9	11
Rayrock.....	Rayrock.....	1	0	3	11	14
Reindeer Station.....	Reindeer Stn.....	1	17	0	2	19
Rocher River.....	Rocher River.....	1	0	7	5	12
Sacred Heart R.C. Residential.	Ft. Providence.....	4	0	96	22	118
Sir John Franklin.....	Yellowknife.....	15	28	28	93	149
St. Annes R.C. Hosp.....	Ft. Smith.....	1	1	18	3	22
St. Josephs R.C. Hosp.....	Fort Resolution.....		Closed during 1958-59			
St. Margarets R.C. Hosp....	Ft. Simpson.....	1	0	7	0	7
Tuktoyaktuk.....	Tuktoyaktuk.....	3	55	0	4	59
Yellowknife P.S.....	Yellowknife.....	12	0	1	283	284
Yellowknife S.S.....	Yellowknife.....	6	0	18	132	150
Totals for Mackenzie Education District.....		138	434	948	1,522	2,904

4. School, Location, and Attendance—Continued

ARCTIC EDUCATION DISTRICT			Status and Number of Pupils Enrolled as of March 31, 1959			
School	Location	No. of Teachers	Eskimo	Indian	Others	Total
Arctic Bay.....	Arctic Bay.....	1	15	0	0	15
Baker Lake.....	Baker Lake.....	2	46	0	2	48
Cape Dorset.....	Cape Dorset.....	1	17	0	0	17
Chesterfield Inlet.....	Chesterfield Inlet.....	4	108	0	8	116
Coral Harbour.....	Southampton Is.....	1	45	0	1	46
Fort Chimo*.....	Fort Chimo.....	1	16	0	6	22
Frobisher Bay.....	Frobisher Bay.....	6	109	0	25	134
Great Whale River*.....	Great Whale River...	4	80	12	1	93
Keewatin Rehab. Project...	Rankin Inlet.....	1	22	0	0	22
Pangnirtung.....	Pangnirtung.....	1	16	0	0	16
Port Harrison*.....	Port Harrison.....	1	28	0	5	33
Povungnituk*.....	Povungnituk.....	1	54	0	0	54
Rankin Inlet.....	Rankin Inlet.....	3	81	0	3	84
Resolute Bay.....	Resolute Bay.....	1	20	0	0	20
Spence Bay.....	Spence Bay.....	1	17	0	0	17
Sugluk*.....	Sugluk.....	1	51	0	0	51
TOTALS FOR ARCTIC EDUCATION DISTRICT.....		30	725	12	51	788
TOTAL FOR BOTH EDUCATION DISTRICTS.....		158	1159	960	1,573	3,692

*Located in Northern Quebec.

5. Part Time Schools—Attendance

MACKENZIE EDUCATION DISTRICT			Status and Number of Pupils Enrolled as of March 31, 1959			
School	Location	No. of Teachers	Eskimo	Indian	Others	Total
Gjoa Haven R.C.....	Gjoa Haven.....	1	14	0	0	14
Holman Is. R.C.....	Holman Is.....	1	7	0	0	7
Bathurst Inlet R.C.....	Bathurst Inlet.....		no attendance			
TOTALS FOR MACKENZIE EDUCATION DISTRICT.....		2	21	0	0	21
ARCTIC EDUCATION DISTRICT						
Eskimo Point.....	Eskimo Pt.....	1	22	0	0	22
Eskimo Point.....	Eskimo Pt.....	1	13	0	0	13
Igloodik.....	Igloodik.....	1	14	0	0	14
Ivuyivik*.....	Ivuyivik.....	1	17	0	0	17
Koartak*.....	Koartak.....	1	13	0	0	13
Lake Harbour.....	Lake Harbour.....	1	24	0	0	24
Maguse River.....	Maguse River.....	1	15	0	2	17
Pelly Bay.....	Pelly Bay.....	1	24	0	0	24
Pond Inlet R.C.....	Pond Inlet.....	1	no attendance reported			
Pond Inlet Ang.....	Pond Inlet.....	1	25	0	0	25
Repulse Bay R.C.....	Repulse Bay.....	1	27	0	0	27
Wakeham Bay*.....	Wakeham Bay.....	1	20	0	0	20
TOTALS FOR ARCTIC EDUCATION DISTRICT.....		12	214	0	2	216
GRAND TOTALS FOR BOTH EDUCATION DISTRICTS..		14	235	0	2	237

*Located in Northern Quebec.

6. Report of Administrator of the Arctic

This office is responsible for the general administration of Arctic areas of the Northwest Territories known as the Districts of Keewatin and Franklin (except Victoria Island and Banks Island) as well as the administration of Eskimo affairs in these areas and in northern Quebec.

Significant changes in the economy of the north were under way in 1958. These changes resulted from a number of factors—greater penetration into the Arctic from the south, an increasing Eskimo population and a decreasing game supply. The problem of introducing some diversification in the economy of the people still living off the land became acute. Incidents of death and privation among the interior Keewatin Eskimos early in 1958 called for drastic remedial measures. A new community was established on the west coast of Hudson Bay at Rankin Inlet for those most seriously threatened by the shortage of caribou. By the end of the year, approximately 120 persons were resettled in this community and had erected their own low-cost housing with guidance and materials organized by the Branch. A school and small store were in operation, and a start had been made on handicraft production as well as organized hunting and fishing projects.

As a further precautionary measure, arrangements were made with the R.C.M.P. to operate a Government aircraft at Frobisher Bay and a second aircraft in Churchill, Manitoba, with funds provided by the Department of Northern Affairs and the Police. Regular patrols were made by the Department of Northern Affairs and the R.C.M. Police, particularly to the outlying camps in the Keewatin District.

Because of the many factors affecting a livelihood from the land, many Eskimos turned to some source of wage employment to support themselves. These changes in their way of life are inevitably bringing problems of adjustment to a great many of the Eskimo people. The task of guiding Eskimos during this difficult transition period falls upon northern service officers and other field staff. Four more northern service officers were employed in 1958, making a total of eighteen stationed at the following points in the Northwest Territories, Northern Quebec and Northern Manitoba: Cambridge Bay, Baker Lake, Frobisher Bay, Sugluk, Tuktoyaktuk, Rankin Inlet, Fort Chimo, Cape Dorset, Churchill and Great Whale River. Three northern service officers stationed at Frobisher Bay, Cambridge Bay and Tuktoyaktuk acted as field liaison officers between the DEW Line employers and the Eskimos working at various stations on the Line.

In the operation of the DEW Line about a hundred Eskimos had permanent employment, and many others found seasonal employment in connection with the Line.

The Administrator's Office assisted the Education Division in the vocational training program for Eskimos. Field officers helped in selection of Eskimo candidates and arranged their transportation to the training centres.

The "Arctic University"—a series of lectures, seminars and language classes designed primarily for new staff members—was held from October to February.

Officials of the District Office again undertook the duties of officer-in-charge of the first and second halves of the Eastern Arctic Patrol, aboard the CGS *C. D. HOWE*, which visited all major communities in the Eastern Arctic between July and October.

In August and September, a party of ten Eskimos from widely scattered communities, together with four officers of the departmental staff in Ottawa made a visit to Greenland on the CGS *ERNEST LAPOINTE*. In addition to this visit and in accordance with the Department's plans to encourage liaison with Arctic administration in other northern countries, two officers made an extensive tour of Alaska at the invitation of the United States Government.

The Ninth Meeting of the Committee on Eskimo Affairs was held in Ottawa on May 26, 1958.

Early in 1959, Regional Administrators at Frobisher Bay and Churchill were established. They supervise field staff in their areas and report to the Administrator of the Arctic. In the Arctic regions, the role of area administrator is performed by the northern service officers. They are responsible both for normal civil administration and for the particular assistance needed by Eskimos during the rapid and decisive adjustments which they are undertaking.

Teachers, social workers and engineers are on the staff of the Administrator in their area, and report by this means. This system is designed for the fullest co-ordination of activities in the north.

Officers of the Administrator of the Arctic represented the Department on such committees as the Interdepartmental Meteorological Committee, Subcommittee of ACND on Northern Transportation, Committee on Eskimo Affairs, Subcommittee on Eskimo Education, Interdepartmental Committee on Fur Promotion, Walrus Committee, and Caribou Technical and Administrative Committee.

Appendix C

1. Location, Area and Comparative Statements of Visitors to the National Parks,
April 1, 1958 to March 31, 1959

	Province	Area	1958-59	1957-58	Increase or Decrease
NATIONAL PARK—					
Banff.....	Alta.	2,564 sq. mi.	880,150	790,910	+ 89,240
Cape Breton Highlands.....	N.S.	377 "	162,938	128,397	+ 34,541
Elk Island.....	Alta.	75 "	222,695	183,041	+ 39,654
Fundy.....	N.B.	79.5 "	179,277	143,662	+ 35,615
Georgian Bay Islands.....	Ont.	5.4 "	14,521	26,300	- 11,779
Glacier.....	B.C.	521 "	386	222	+ 164
Jasper.....	Alta.	4,200 "	332,251	332,024	+ 227
Kootenay.....	B.C.	543 "	385,736	347,678	+ 38,058
Mount Revelstoke.....	B.C.	100 "	27,669	39,028	- 11,359
Point Pelee.....	Ont.	6 "	604,149	591,235	+ 12,914
Prince Albert.....	Sask.	1,496 "	135,546	123,280	+ 12,266
Prince Edward Island.....	P.E.I.	7 "	206,245	200,748	+ 5,497
Riding Mountain.....	Man.	1,148 "	667,561	630,189	+ 37,372
St. Lawrence Islands.....	Ont.	172 acres	53,573	59,250	- 5,677
Waterton Lakes.....	Alta.	203 sq. mi.	362,829	302,872	+ 59,957
Yoho.....	B.C.	507 "	51,817	41,875	+ 9,942
SUB-TOTAL.....		11,832.2 sq. mi.	4,287,343	3,940,711	+346,632
NATIONAL HISTORIC PARKS					
Alexander Graham					
Bell Museum.....	N.S.	14 acres	45,804	36,053	+ 9,751
Fort Anne.....	N.S.	31 "	30,443	24,052	+ 6,391
Fort Battleford.....	Sask.	37 "	18,099	15,214	+ 2,885
Fort Beausejour.....	N.B.	81 "	16,051	13,778	+ 2,273
Fort Chambly.....	P.Q.	2.5 "	56,804	72,965	- 16,161
Fort Langley.....	B.C.	9 "	55,010	*3,500	+ 51,510
Fort Lennox.....	P.Q.	210 "	10,816	13,335	- 2,519
Fortress of Louisbourg.....	N.S.	339.5 "	25,796	20,705	+ 5,091
Fort Malden.....	Ont.	5 "	28,855	21,197	+ 7,658
Fort Wellington.....	Ont.	8.5 "	18,859	17,426	+ 1,433
Grand Pré.....	N.S.	14 "	38,945	31,362	+ 7,583
Halifax Citadel.....	N.S.	37 "	237,259	234,000	+ 3,259
Port Royal					
Habitat.....	N.S.	20.5 "	28,085	23,441	+ 4,644
Signal Hill.....	Nfld.	243.37 "	26,307	*500	+ 25,807
Sir Wilfrid Laurier's					
Birthplace.....	P.Q.	1.5 "	6,363	*4,650	+ 1,713
Woodside.....	Ont.	11 "	2,046	1,284	+ 762
Batoche Rectory.....	Sask.	1.25 "	*600	*800	- 200
Cartier-Brebeuf.....	P.Q.	5 "	*10,200	+ 10,200
Lower Fort Garry.....	Man.	13 "	*15,000	*21,300	- 6,300
Fort Prince of Wales.....	Man.	50 "	425	*550	- 125
SUB-TOTAL.....		1,134.12 acres	671,767	556,112	+115,655
GRAND TOTAL.....			4,959,110	4,496,823	+462,287

*Estimated.

N.B.—No attendance records available for Wood Buffalo Park, Alta.—N.W.T. (17,300 sq. mi.) Terra Nova Park, Nfld. (156 sq. mi.).

2. Mileage of Park Roads and Trails

National Park	Motor Roads	Secondary Roads	Fire Roads	Trails
Banff.....	216.50	—	135.75	714.25
Cape Breton Highlands.....	56.26	9.47	58.79	25.87
Elk Island.....	18.00	8.00	18.00	44.00
Fundy.....	19.90	—	—	—
Georgian Bay Islands.....	—	—	11.25	28.00
Glacier.....	—	—	25.75	124.50
Jasper.....	146.50	20.00	101.80	622.75
Kootenay.....	59.40	—	53.80	199.50
Mount Revelstoke.....	18.50	—	—	47.00
Point Pelee.....	11.50	2.00	2.00	1.50
Prince Albert.....	65.70	67.75	—	250.75
Prince Edward Island.....	15.15	4.85	—	1.00
Riding Mountain.....	75.05	13.56	96.50	12.00
Waterton Lakes.....	43.80	13.50	29.00	83.00
Yoho.....	41.10	—	39.00	250.00
TOTAL.....	787.36	139.13	571.64	2,404.12

3. Major Construction in Parks*

National Park	By National Parks Branch	By Private Enterprise
BANFF.....	No new major construction....	74 building permits issued for total construction value of \$1,646,103; 5 permits were for construction exceeding \$2,500; Banff School of Fine Arts, Archway Motel and Bel Plaza Motel additions; also, Sulphur Mountain and Mount Whitehorn Gondola Lifts
JASPER.....	No new major construction....	76 building permits issued for total construction value of \$585,441; completed during this period were a hotel, 2 service stations, a motel and a bungalow camp; also, completed addition to high school.
ELK ISLAND.....	Staff duplex residence at headquarters and gate office at North Gate being built under D.P.W. contract.	

*Reassessment of definition of Major Construction has eliminated much of the minor work reported in previous years.

4. Fire Losses in the National Parks

Park	Number of Fires		Area Burned (acres)		Cost of Suppression	
	1953-57 Av. 1958		1953-57 Av. 1958		1953-57 Av. 1958	
					\$ cts	\$ cts
Banff.....	7.5	1	13.6	3.0	492.41	82.30
Jasper.....	4.8	12	5.0	10.8	695.02	486.35
Glacier.....	3.2	2	12.7	6.0	2,048.49	3,025.51
Kootenay.....	1.6	2	24.4	1.5	1,543.27	297.10
Yoho.....	4.4	3	180.0	0	4,249.22	0
Revelstoke.....	1.2	2	1.4	2.0	397.71	155.00
Waterton Lakes.....	0.6	0	0	0	16.66	0
Elk Island.....	0.0	1	0	4.0	0	12.00
Prince Albert.....	2.0	0	20.3	0	545.98	0
Riding Mountain.....	1.6	14	323.0	1,372.6	635.94	2,356.51
Georgian Bay Islands.....	0.4	0	0	0	0	0
St. Lawrence Islands.....	1.6	0	.8	0	17.86	0
Point Pelee.....	0.2	1	0	.4	1.25	15.00
Fundy.....	0.2	1	0	0	58.40	2.00
Prince Edward Island.....	0.8	1	.1	1.5	1.20	0
Cape Breton Highlands.....	0.8	0	1.9	0	164.08	0
Terra Nova.....	—	0	—	0	—	0
TOTALS.....	30.9	40	583.2	1,401.8	10,867.49	6,431.77

Causes			Size Classes		
Smokers.....	10	Incendiary.....	4	0-½ Acre A.....	17
Campfires.....	5	Unclassified.....	3	½-10 Acres B.....	14
		(Garbage Fires)			
Railways.....	3	Unknown.....	4	10-100 Acres C1....	4
Public Works.....	5	Settlers.....	2	100-500 Acres C2....	4
Lightning.....	4	—		500 A +	D 1

5. Statement of Large Mammals in Fenced Enclosures in National Parks

	Buffalo	Elk	Moose	Mule Deer	White-tailed Deer	Total
Banff Park Paddock.....	10	—	—	—	—	10
Elk Island Park Paddock....	975	823	203	40	55	2101
Prince Albert Park Paddock..	10	—	—	—	—	10
Riding Mountain Park Paddock.....	25	20	3		37	85
Waterton Lakes.....	18	—	—	—	—	18
	1,038	843	211	40	92	2,224

6. Reduction of Mammals

National Park	Mammal	Number Killed	Disposal of Meat and Hides
BANFF.....	Elk	100	Meat and hides donated to Indian Affairs Branch and Banff Indian Days Committee.
	Buffalo	2	Meat consumed at departmental work camp.
ELK ISLAND.....	Buffalo	355	Meat sold by tender. Approximately 50% of the hides sold by tender, balance sold by the Department.
	Elk	177	Meat and hides donated to Indian Affairs Branch.
	Moose	92	
JASPER.....	Elk	88	Meat and hides donated to Indian Affairs Branch.
WATERTON LAKES.....	Buffalo	12	All hides and 8 carcasses of meat donated to Indian Affairs Branch. Balance of meat consumed at departmental work camp.
	Elk	201	Meat and hides donated to Indian Affairs Branch.
PRINCE ALBERT.....	Buffalo	8	Meat consumed at departmental work camp. Hides sold by the Department.
RIDING MOUNTAIN.....	Buffalo	16	Hides sold by the Department. Ten carcasses of meat donated to Indian Affairs Branch, balance of meat consumed at departmental work camps.

7. Tablets Unveiled in 1958.

Honourable Jean Charles Chapais and his son Thomas, St. Louis de Kamouraska, P.Q.
 Meetings of the Parliament of Canada in Toronto, Ontario, prior to Confederation.
 The Francois Baby House, Windsor, Ontario.
 Father Louis-Pierre Gravel, Gravelbourg, Saskatchewan.
 The Mooring Rings, Victoria, British Columbia.
 Fort McLeod, McLeod's Lake, British Columbia.

8. Tablets Erected in 1958 but Not Unveiled.

Arthur Silver Morton, University of Saskatchewan, Saskatoon.
 Peter Mitchell, Newcastle, New Brunswick.

9. Members of Historic Sites and Monuments Board.*

Rt. Rev. Mgr. A. d'Eschambault, Genthon, Manitoba, (Chairman).
 Dr. Walter N. Sage, Vancouver, British Columbia.
 Dr. W. Kaye Lamb, Dominion Archivist, Ottawa, Ontario.
 Dr. A. G. Bailey, Dean of Arts, Fredericton, New Brunswick.
 Dr. C. B. Fergusson, Halifax, Nova Scotia.
 Richmond Mayson, Esq., Prince Albert, Saskatchewan.
 Edouard Fiset, Esq., Quebec, Quebec.
 Jules Bazin, Esq., Montreal, Quebec.

*as of December 1st, 1959.

- O. L. Vardy, Esq., St. John's, Newfoundland.
Dr. A. R. M. Lower, Queen's University, Kingston, Ontario.
Dr. D. G. Creighton, University of Toronto, Toronto, Ontario.
R. Earl Taylor, Esq., Charlottetown, Prince Edward Island.
Richard Y. Secord, Esq., Winterburn, Alberta.
J. D. Herbert, Esq., National Historic Sites Division, Ottawa, Ontario, (Secretary).

10. Banding of Wild Birds

Species	Number
Banded in 1958—	
Ducks (including Coots).....	76,422
Geese.....	870
Trumpeter Swans.....	4
Colony nesting water birds.....	18,985
Other Migratory Birds.....	25,244
TOTAL.....	121,525
Banded to date.....	1,318,903
Banded birds recovered to date.....	171,564
(This total includes birds banded in Canada and recovered in Canada or elsewhere; also records of birds banded elsewhere than in Canada and recovered in this country.)	

11. Licences and Permits Issued Under the Migratory Birds Convention Act

Nature of Permit or Licence	Number Issued
To collect birds for scientific purposes.....	412
To take migratory birds for propagation.....	15
To possess migratory birds for propagation.....	679
For bird-banding.....	269
For taxidermy.....	67
TOTAL.....	1,442

Appendix D

1. Research in the Economics of Forestry

Advisory Committee on Forestry Statistics

The participation of the Section staff in the work of the Interdepartmental Advisory Committee on Forestry Statistics constituted the major portion of the year's activities. A comprehensive memorandum was prepared for the Dominion Statistician covering the whole field of forestry statistics and recommending improvements in methods for obtaining more complete coverage. One of the more important recommendations was the development of a separate forest products questionnaire for use in the 1961 Census of Agriculture. The Section provided an observer for a test survey of farm woodlot production carried out by the Dominion Bureau of Statistics and using the questionnaire developed by the Committee.

In co-operation also with D.B.S. an analysis of export data on primary forest products for the month of October, 1958 was prepared to show the necessity for reporting export statistics by province of origin rather than by port of exit.

Analysis of Christmas Tree Production

Export data for the Canadian Christmas tree industry for the year 1957 were recompiled by province of origin, and the resulting publication, *The Christmas Tree Industry in Canada*, gave the complete picture of the source and destination of Christmas trees produced in Canada.

Pilot Study—Forest Production on Private Lands

At the suggestion of the Interdepartmental Advisory Committee and in co-operation with the New Brunswick Department of Lands and Mines, a study was made of sampling procedures to be used in estimating forest production from small private holdings in New Brunswick. A pilot survey was carried out in the southwest portion of the province and a preliminary report of the results obtained indicated that the method employed could be used successfully in conjunction with information obtained for large private holdings and for Crown lands.

Rehabilitation of Whitehorse Airport Escarpment

In co-operation with the Forest Research Division, an investigation was made into the feasibility and costs of restoring forest cover to the eroded slopes of the airport escarpment at Whitehorse, Yukon Territory. The report, which was prepared for departmental use, included estimates of cost for two different planting measures which could be used in conjunction with drainage improvements to bring about the rehabilitation of the slope.

2. Annual Forest Depletion¹

	Millions of Cu. ft. of Usable Wood		Percentage of Depletion	
	1947-56	1957 ²	1947-56	1957
Products utilized:				
Logs and bolts.....	1,453	1,436	42.7	45.3
Pulpwood.....	1,241	1,318	36.5	41.6
Fuelwood.....	376	280	11.0	8.8
Other products.....	77	61	2.3	1.9
TOTAL.....	3,147	3,095	92.5	97.6
Wastage:				
By forest fires.....	255	75	7.5	2.4
GRAND TOTAL.....	3,402	3,170	100.0	100.0

¹Does not include wastage caused by agencies other than fire, such as insects, diseases, and natural mortality for which no reliable estimates are available.

²Preliminary estimate.

3. Forest Industries

SUMMARY OF PRINCIPAL STATISTICS, 1956

	Number of Employees	Salaries and Wages	Net Value of Production ¹	Gross Value of Production
		\$	\$	\$
Woods operations.....	132,015 ²	472,035,290	841,334,193	939,142,602
Pulp and paper industry.....	65,985	297,571,944	736,346,393	1,465,057,726
Lumber industry.....	57,078	153,809,204	279,710,804	639,414,360
Wood-using industries.....	78,505	222,540,063	366,512,499	815,543,652
Paper-using industries.....	27,720	89,314,472	172,380,525	436,213,262
TOTAL.....	361,303	1,235,270,973	2,396,284,414	—

¹Net value of production is gross or sale value, less cost of materials, fuel, purchased electricity, and process supplies consumed.

²Man-year basis (300 working days).

4. Forest Fire Losses in Canada, 1957*(Compared with 10-year average 1947-56)*

	Provinces		Yukon and N.W.T.	
	Annual Average 1947-56	1957	Annual Average 1947-56	1957
Total number of fires.....	5,227	5,950	98	130
Total area burned (acres).....	1,535,885	452,356	554,020	450,904
Size of average fire (acres).....	294	76	5,653	3,468
Saw timber burned (M ft. b.m.).....	383,419	175,629	12,571	83
Small material (cords).....	1,886,964	442,206	178,044	26,198
Actual cost of fire fighting.....	\$ 2,843,147	\$ 2,019,475	\$46,139	\$55,042
Other fire protection costs (1956).....	\$ 14,135,484	\$ 20,512,055	\$111,475	\$275,382
Area under protection (sq. mi.).....	—	1,208,170	—	125,000

5. Reforestation Under the Forestry Agreements

Province	Number of Trees Planted		Area Planted		Area seeded	
	Fiscal Year 1958-59	Total to Date	Fiscal Year 1958-59	Total to Date	Fiscal Year 1958-59	Total to Date
			acres	acres	acres	acres
Prince Edward Island.....	47,000	378,000	40	306	—	—
Nova Scotia.....	193,000	915,000	231	1,087	—	—
Ontario.....	13,070,000	68,860,000	13,070	68,860	—	6,000
Manitoba.....	850,000	4,970,000	774	4,303	—	—
Saskatchewan.....	233,000	1,625,000	250	1,353	374	1,636
British Columbia.....	1,155,000	13,104,000	1,438	15,598	—	—
TOTAL.....	15,548,000	89,852,000	15,803	91,507	374	7,636

6. Payments to Provinces Under the Inventory and Reforestation Agreements

Province	Forest Inventory		Reforestation		Total Federal Payments	
	Fiscal Year 1958-59	Total to Date	Fiscal Year 1958-59	Total to Date	Fiscal Year 1958-59	Total to Date
	\$	\$	\$	\$	\$	\$
Prince Edward Island.....	—	—	17,281	102,920	17,281	102,920
Nova Scotia.....	16,170	323,720	2,752	11,695	18,922	335,415
New Brunswick.....	9,175	138,503	—	—	9,175	138,503
Ontario.....	205,571	1,953,635	157,533	749,541	363,104	2,703,176
Manitoba.....	22,820	348,955	8,500	61,964	31,320	410,919
Saskatchewan.....	19,358	271,295	2,705	16,617	22,063	287,912
Alberta.....	110,480	649,859	—	—	110,480	649,859
British Columbia.....	443,109	3,360,314	11,550	148,731	454,659	3,509,045
TOTAL.....	826,683	7,046,281	200,321	1,091,468	1,027,004	8,137,749

**7. Payments to Provinces Under the Forest Fire Protection and Access Roads
and Trails Agreements**

Province	Forest Fire Protection		Access Roads and Trails	
	Fiscal Year	Total	Fiscal Year	Total
	1958-59	to Date	1958-59	to Date
	\$	\$	\$	\$
Newfoundland.....	54,741	88,654	56,202	59,074
Prince Edward Island.....	2,250	3,768	—	—
Nova Scotia.....	35,808	56,340	31,755	45,895
New Brunswick.....	52,364	89,226	21,761	51,595
Ontario.....	220,709	373,307	988,714	1,237,961
Manitoba.....	49,840	91,889	235,556	353,769
Saskatchewan.....	68,920	118,423	179,438	274,495
Alberta.....	94,573	156,669	133,296	156,938
British Columbia.....	170,795	271,724	441,243	518,606
TOTAL.....	750,000	1,250,000	2,087,965	2,698,333

Appendix E

Natural History Branch and Human History Branch

Wednesday Evening Adult English Lectures

- "Oddities of the Sea"—John F. Storr, University of Miami.
- "Russia—the New Face"—Neil Douglas, explorer-lecturer.
- "1200 Bald Eagles"—Charles L. Broley, naturalist.
- "Folk Songs of Ontario"—Edith Fowke, folklorist.
- "Newfoundland Travelogue"—D. M. Baird, Ph.D., University of Ottawa.
- "Ontario Mennonites"—Blodwen Davies, author and folklorist.
- "Ripple Rock" and "Generator 4" (films), Dupont Co. of Canada (1956) Ltd., Aluminium Co. of Canada, Ltd.
- "Flowers of the Midnight Sun"—R. W. Wood, J.D., A.R.P.S.
- "The Wonder Metal"—K. H. J. Clarke, B.A.Sc., N.D.C., International Nickel Co. of Canada, Ltd.
- "Secrets of the Deep Sea"—film from Royal Danish Embassy, introduced by E. L. Bousfield, Ph.D., National Museum of Canada.
- "The Races of Burma and S.E. Asia"—L. Oschinsky, Ph.D., National Museum of Canada.
- "Two Totem Towns"—Wilson Duff, Provincial Museum of British Columbia.
- "Manitoba—Land of the Manitou"—H. A. Quinn, Ph.D., Geol. Survey of Canada.
- "Scandinavian Folklore"—W. E. Richmond, Ph.D., Indiana University.
- "Bermuda in Bloom"—R. O. Earl, Ph.D., Queen's University.
- "Volcano In The Sea"—W. H. Parsons, Ph.D., Wayne State University.
- "Petroleum—From Fossil to Fabric"—W. D. Stuart, Can. Petroleum Association.

Special Adult English Lectures

- Opening of Fish Exhibit "Canadian Fish and Fisheries"—G. R. Clark, Deputy Minister of Fisheries.
- "The Silent World" film showing. 6 showings.
- "The Migration and Native Use of Greenland Birds"—Dr. Finn Salomonsen, Zoologisk Museum, Copenhagen.
- "Galathea Deep Sea Expedition"—Dr. Torben Wolff, Zoologisk Museum, Copenhagen.
- Opening of Exhibit "The Changing Eskimo"—His Excellency, John Knox, Ambassador of Denmark.
- Opening of Exhibit "Birch Bark".
- "Canada In Colour" summer film showings (N.F.B. and N.M.C.)

Adult French Lectures

- "Le développement des Alpes françaises du Nord depuis 50 ans", Raoul Blanchard, l'Université de Grenoble.
- "En passant par la Lorraine"—M. F. Weymuller, l'Ambassade de France au Canada.
- "Les Marionnettes de Montréal"—Micheline Legendre, Marionnettiste et Directrice de "Les Marionnettes de Montréal".
- "Epanouissement et superposition des cultures en Espagne et au Mexique"—Henri Prat, l'Université de Montréal.

Saturday Morning Children's programs

U.K. Travelogue (Royal Commonwealth Society).

"The Silent World", underwater film.

5 Films on natural history.

4 Assorted natural history and human history films.

3 Nature films.

Films on Australia and New Zealand (Royal Commonwealth Society).

"World In A Marsh" (nature film), "Man Explores Space" (Disney film).

Rattlesnakes (live) S. W. Gorham, National Museum of Canada.

"Nigeria Greet Her Queen" (Royal Commonwealth Society).

Magic Show, Legari the Magician.

"The Unchained Goddess", weather film, Bell Telephone Co. of Canada.

Films on India, Pakistan, Ceylon (Royal Commonwealth Society).

"Northwest Passage", feature film, with Indian locale.

"Manitoba—Land of the Manitou"—H. A. Quinn, Ph.D., Geol. Survey of Canada.

Films on South and West Africa (Royal Commonwealth Society).

Nature Films.

Royal Danish Embassy films.

Puppets (Mrs. A. W. Horwood) and two eskimo films.

Appendix F

LIST OF TECHNICAL PUBLICATIONS ISSUED 1958-59

National Parks Branch

Canadian Wildlife Service

Translations of Russian Game Reports

- Volume 3 Arctic and Red Foxes, 1951-55.
- Volume 4 The Bird Bazaars of Novaya Zemlya.
- Volume 5 Sable and Squirrel, 1951-55.
- Russian—English Bird Glossary.

Wildlife Management Bulletin

- Series 2, Number 9. The American Goldeneye in Central New Brunswick.
Brian C. Carter.

Technical Articles

- A Preliminary Study of the Ungava Caribou. A. W. F. Banfield and J. S. Tener. *J. Mamm.* 39(4): 560-573, 1958.
- Ross's Geese Nesting at Southampton Island, N.W.T., Canada. T. W. Barry (collaboration). *The Auk* 75(1): 89-90, 1958.
- Moose "Sickness" in Nova Scotia. D. A. Benson. *Can. J. Comp. and Vet. Sci.* 22(7): 244-248, (8): 282-286, 1958.
- Hand-reared Mallard Releases in the Maritime Provinces, George F. Boyer. *Can. Field-Nat.* 73(1): 1-5, 1959.
- On Some Helminth Parasites Collected from the Musk Ox (*Ovibus moschatus*) in the Thelon Game Sanctuary, Northwest Territories. H. C. Gibbs and J. S. Tener. *Can. J. Zool.* 36(4): 529-532, 1958.
- Do Eared Grebes have Dump Nests? J. B. Gollop. *Blue Jay*, 16(4): 151, 1958.
- Albino American Coots Near Vermilion, Alberta. R. D. Harris, *Can. Field-Nat.* 72(4): 174, 1958.
- Arviliguarmiut Names for Birds and Mammals. A. H. Macpherson. *Arc. Circ.* 11(2): 30-33, 1958.
- Ornithological Research at Pelly Bay in the summer of 1956. A. H. Macpherson. *Arc. Circ.* 11(1): 11-13, 1958.
- Observations on the Lesser Snow Goose nesting grounds, Egg River, Banks Island. Eoin H. McEwen. *Can. Field-Nat.* 72(3): 122-127, 1958.
- Some Additions to the List of Birds of the Mackenzie Delta. W. E. Stevens (collaboration). *Am. Field-Nat.* 72(4): 168-170, 1958.
- Present Distribution and Population of the Starling in Newfoundland. Leslie M. Tuck. *Can. Field-Nat.* 72(3): 139-144, 1958.
- The Distribution of Muskoxen in Canada. J. S. Tener. *J. Mamm.* 39(3): 398-408.

Water Resources Branch

Water Resources Papers

- No. 120 Atlantic Drainage, Climatic Years 1954-55, 1955-56.
- No. 115 St. Lawrence and Southern Hudson Bay Drainage, Climatic Years 1953-54, 1954-55 (bilingual).

Booklets

- Water Powers of Canada (English and French).

Mimeographed Reports

1. Hydro-Electric Progress in Canada, 1958, Bulletin No. 2625 (English and French).
2. Water Power Resources of Canada, Bulletin No. 2642 (English and French).
3. Principal Hydro-Electric and Hydraulic Developments in Canada with Turbine Capacities not less than 2,000 hp., as at 31 December 1958, Bulletin No. 2640.
4. Provisional List of Principal Thermal-Electric Generating Stations in Canada with Prime Mover Capacities not less than 2,000 hp., as at 31 December 1957, Bulletin No. 2601.

Forestry Branch

Technical Notes

- No. 66 Scarifying for Jack Pine Regeneration in Manitoba. J. H. Cayford.
No. 67 Rooting Habits of Lodgepole Pine. K. W. Horton.
No. 68 Chemical Herbicides and Their Uses in the Silviculture of Forests of Eastern Canada. R. F. Sutton.
No. 69 Nine Years of Observations on the Condition of 241 Yellow Birch. D. A. Fraser.

Miscellaneous Series

- No. 10 The Christmas Tree Industry in Canada (Third Edition).

Periodicals

- Forests Fire Protection Abstracts
Vol. VIII No. 2
Vol. IX No. 1
Forest Fire Losses in Canada, 1956.
Canada's Forests, 1959.
Annual Report on Forest Research for Year Ended March 31, 1958.
1959 Amendments—Bulletin 106—Forest and Forest Products Statistics.

Mimeographed

- Factors Affecting Natural Regeneration on Cut-over and Burned-over Lands, Newfoundland. W. A. Dickson, D. E. Nickerson.
Growth of Jack, Red and Scots Pine and White Spruce Planted in 1922 at Grand-Mère, P.Q. J. D. MacArthur.
Seeding Jack Pine, Sandilands Forest Reserve, Manitoba. J. H. Cayford.
Observations on the Use of Prescribed Burning and Other Silvicultural Practices in the Pine Types of New Jersey and the Carolinas. A. Bickerstaff.
Two Grades of Partial Cutting in Black Spruce Stands, 1950, Hants County, Nova Scotia. M. H. Drinkwater.
Forest Conditions on the Lower Peace River. D. S. Lacate, K. W. Horton.
Our Co-operative White Spruce Provenance Experiment. M. J. Holst.
Partial Cutting with Diameter Limit Control in the Lake Edward Experimental Forest, Quebec, 1950 to 1956. R. J. Hatcher.
Key To The Native Trees of Canada. T. C. Brayshaw.
The Relascope, Its Principles and a Test in Eastern Canada. T. G. Honer, L. Sayn-Wittgenstein.
Valcartier Forest Experiment Station, Northwest Portion, Period 1933-1955, on Camp Valcartier Area, Dept. of National Defence. R. G. Ray.
Growth of Alberta White Spruce after Release from Aspen Competition. G. Ontkean, L. A. Smithers.
Spacing as a Factor in the Development of Red Pine Plantations. W. M. Stiell, A. Bickerstaff.
Rehabilitation of the Whitehorse Airport Escarpment. W. M. Stiell and P. H. Jones.

Reprints of Articles and Papers

- A Spacing Aid for Machine Planting, W. M. Stiell. U.S.D.A. Tree Planters' Notes, February 1958.
- Soil Sterilants and Herbicides in Forest Fire Control, D. G. Fraser, Woodlands Review, Pulp and Paper Magazine of Canada, May 1958.
- A Planting Method Experiment with White Spruce, W. M. Stiell. Woodlands Review, Pulp and Paper Magazine of Canada, June 1958.
- Pulpwood Plantations in Ontario and Quebec, W. M. Stiell. Woodlands Section, Index No. 1770 (F-2) July 1958, Canadian Pulp and Paper Association.
- What Price Browsing? M. H. Drinkwater. Timber of Canada, July 1958.
- Growth Mechanisms in Hardwoods, D. A. Fraser. Woodlands Review, Pulp and Paper Magazine of Canada, October 1958.
- Planting Red Spruce on Ill-drained Land, J. W. McLeod. Woodlands Review, Pulp and Paper Magazine of Canada, October 1958.
- A Standard for Spot Seeding, J. Krewaz, Forestry Chronicle, December 1958.
- Seasonal Leader Growth of Lodgepole Pine in the Subalpine Forest of Alberta, K. W. Horton, Forestry Chronicle, December 1958.
- Big Timber in the Far North, K. W. Horton, Timber of Canada, December 1958.
- Planting for Christmas Trees, J. W. McLeod, University of New Brunswick Forest Extension Service, January 1959.
- Five-year Progress Report on Project RC-17. D. W. MacLean. Woodlands Research Index No. 112, Pulp and Paper Research Institute of Canada.
- Our Forests—Riches that Grow. (Annual Report, 1957-58, Department of Northern Affairs and National Resources.)
- Partial Cutting with Diameter Limit Control in the Lake Edward Experimental Forest, Quebec 1950 to 1956, R. J. Hatcher. Woodlands Review, Pulp and Paper Magazine of Canada, Convention 1959.
- Growth of Jack, Red and Scots Pine and White Spruce Plantations 1922 to 1956, Grand-Mère, P.Q., J. D. MacArthur. Woodlands Review, Pulp and Paper Magazine of Canada, Convention 1959.
- Highlights of 5-year progress report on RC-17, D. W. MacLean. Woodlands Review, Pulp and Paper Magazine of Canada, March 1959.

Addresses and Articles Not Listed Under Reprints

- High-yield silviculture at the Petawawa Forest Experiment Station, M. G. Bowen. Paper presented at field meeting. Woodlands Section, C.P.P.A. September 1958.
- Our co-operative white spruce provenance experiment, M. J. Holst. Paper presented at field meeting Woodlands Section, C.P.P.A. September 1958.
- The Petawawa Forest Experiment Station. Paper presented at field meeting Woodlands Section, C.P.P.A., September 1958.
- Co-ordination of Forest Fire Research in Canada, J. C. Macleod. Paper presented at Forest Fire Research Conference, Dorset, Ontario, Aug. 1958.
- A photoreaction in paper birch seedlings, C. W. Yeatman and G. K. Vaight, Forest Science, Vol. 4, No. 3, September 1958.
- Interspecific grafting of hard pines, M. J. Holst and J. B. Santon. Paper presented Seventh Annual Meeting of Committee on Forest Tree Breeding in Canada, Montreal, 17-19 August 1958.
- Fifty Years of Forestry in Canada—The Scotsman, December 1958. P.H. Jones.

Forest Products Laboratories of Canada**Technical Notes**

- Tech. Note 2 Le séchage artificiel à haute température des bois résineux de l'est du Canada. J. L. Ladell.
- Tech. Note 8 Durability of Urea-formaldehyde and Casein Adhesives at Elevated Temperatures. E. G. Bergin.
- Tech. Note 9 The Efficiency of Scarf Joints. A. P. Jessome.
- Tech. Note 10 The Short-Log Bolter—Its Use in Conversion of Canadian Woods. W. W. Calvert.

Technical Reports

Export Packing.

Wood Residues in the Pembroke Forest District of Ontario. J. A. Doyle, FPLC, and J. D. Giles, Ont. Dept. Lands and Forests.

The Vancouver Laboratory.

Program of Work.

Semi-Annual Reports.

List of Publications.

Monthly News Letter—"FPLC Reports".

Reprints

Research and more research—The answer to our problems. J. H. Jenkins. Timber of Canada.

Grading time studies in the B.C. Southern Interior. D. C. Gunn and F. W. Guernsey. B.C. Lumberman.

Application of the logistic function to toxicity testing of wood preservatives. T. S. McKnight. Forest Products Journal.

Circular Headrig—How to get the most from it. G. W. Andrews. Timber of Canada.

Determination of dihydroquercetin in Douglas fir and western larch wood. G. M. Barton and J. A. F. Gardner. Analytical Chemistry.

Differentiation of sapwood and heartwood in western hemlock by colour tests. H. W. Eades. Forest Products Journal.

Is spiral grain the normal growth pattern? P. L. Northcott. Forestry Chronicle.

Distribution and fungicidal extractives in target pattern heartwood of western red cedar. H. MacLean and J. A. F. Gardner. Forest Products Journal.

The plywood industry of Japan. J. H. Jenkins. Canadian Woodworker.

Controlling your sawmill production. G. W. Andrews. Canada Lumberman.

Japan's plywood industries. J. H. Jenkins. Canada Lumberman.

The extraneous components of western red cedar. J. A. F. Gardner and G. M. Barton. Forest Products Journal.

Wood failure—Within species and between species. P. L. Northcott. Forest Products Journal.

The Forests and Forest Industries of Australia and New Zealand. J. H. Jenkins. Timber of Canada.

Reducing heat distortion in the knife and pressure bar assemblies of veneer lathes. A. O. Feihl. Forest Products Journal.

Factors affecting the amount of naphthalene in condensate during boiling under vacuum in creosote. G. Bramhall and W. M. Connors. Forest Products Journal.

High temperature kiln-drying of lumber. A survey of Eastern Canadian progress. W. W. Calvert. Forest Products Journal.

Increasing the durability of wood. H. P. Sedziak. Canada Lumberman.

The chemical composition and pulping characteristics of normal and tension wood of aspen poplar and white elm. L. P. Clermont and F. Bender. Pulp and Paper Magazine of Canada.

Revue des modes d'Utilisation des forêts du Canada. J. H. Jenkins.

Traitement des poteaux de clôture fait d'essences peu durables au moyen de préservatifs en milieu aqueux par la méthode de l'imprégnation de la base. J. Krzyzewski.

Some factors influencing the design of Douglas fir plywood panels. H. G. M. Colbeck and P. L. Northcott. Forest Products Journal.

The effect of compression wood on the mechanical properties of white spruce and red pine. E. Perem. Forest Products Journal.

- A Canadian's impressions of Russia's forest industries. J. H. Jenkins. *Forest Products Journal*.
- Electrode systems for stray field heating. D. G. Miller. *Canadian Woodworker*.
- Fungistatic effectiveness and leachability of copper abietate and formate preservatives. T. S. McKnight and Elizabeth Merrall. *Forest Products Journal*.
- Review of literature on bark adhesion and methods of facilitating bark removal. E. Perem. *Pulp and Paper Magazine*.
- Spiral grain in wood. P. L. Northcott. *B.C. Lumberman*.
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- How to select adhesives. E. G. Bergin. *Canadian Woodworker*.
- Lumber—Is its future secure? J. H. Jenkins. *Timber of Canada*.
- Salvage yarding on the B.C. Coast. J. A. McIntosh and D. C. Gunn. *B.C. Lumberman*.
- Physical and anatomical characteristics of hardwoods. J. D. Hale. *Pulp and Paper Magazine of Canada*.
- Will synthetics replace wood products? J. H. Jenkins. *Canadian Woodworker*.
- Work of FPLC of interest to pulp and paper industry. *Pulp and Paper Magazine*.
- Ultrasonic device for detecting blisters in plywood. (FPL News Release published in various trade journals.)

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- The Seventh British Commonwealth Forestry Conference. J. H. Jenkins. *Forestry Chronicle*, March 1958.
- How to figure the chip potential of your sawmill. G. E. Bell. *Canada Lumberman*, April 1958.
- Forestry and the economic structure of the country. J. H. Jenkins. *Australian Timber Journal*, February 1958.
- Blistering of paints on wood. J. J. G. Veer. *Timber Technology (England)*, April 1958.
- Barking and chipping—How much does it cost? G. E. Bell. *Timber of Canada*, April 1958.
- High-temperature kiln-drying of Eastern Canadian softwoods. J. L. Ladell. *Australian Timber Journal*, April 1958.
- Gluing pre-treated laminating stock. P. L. Northcott. *Wood (England)*, March 1958.
- High-temperature kiln-drying of lumber—A summary of Canadian progress. W. W. Calvert. *Forest Products Journal*, July 1958.
- Reducing heat distortion in veneer lathes. A. O. Feihl. *Timber Technology*, December 1958.
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- Occurrence of beta-dolabrin (4-isopropenyltropolone) in western red cedar (*Thuja plicata* Donn.). J. A. F. Gardner and G. M. Barton. *Canadian Journal of Chemistry*, December 1958.

Natural History Branch of the National Museum

- A Preliminary Study of the Ungava Caribou. A. W. F. Banfield with John Tener in *Journal of Mammalogy* 39(4): 560-573.
- Dermoid Cysts—a basis of Indian legends. A. W. F. Banfield. *Science in Alaska*, Trans. 6, Alaska Science Conference, 1955.
- Plants of the Clay Belt of Northern Ontario and Quebec. W. K. W. Baldwin. *Bull., Nat. Mus. Canada*, 156: 324 pages. 1959.

- A zoogeographical study of the amphibians and reptiles of Eastern Canada. Sherman Bleakney. Bull., Nat. Mus. Canada, 155: 119 pages. 1958.
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- Postglacial dispersal in the turtle *Chrysemys picta*. Sherman Bleakney. Herpetologica, Vol. 14, Part 2, July 23, 1958.
- Variations in a litter of Northern Water Snakes, from Ottawa, Ont. Sherman Bleakney. Can. Field-Nat. 72(3): 122-132.
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- Mammals of the Islands of the Gulf of St. Lawrence. Austin W. Cameron. Bull., Nat. Mus. Canada, 154: 165 pages. 1959.
- Mammals of Banff National Park. Austin W. Cameron. Bull., Nat. Mus. Canada, 159:53 pages. 1959.
- Review of "A Guide to Saskatchewan Mammals" by W. H. Beck. Austin W. Cameron. Can. Field-Nat. 73(1): 60.
- Review of "Animal Tracks and Hunter Signs" by Ernest Thompson Seton. Austin W. Cameron. Can. Field-Nat. 73(1):61.
- New Mammal Records for Prince Edward Island. Austin W. Cameron. Journal of Mammalogy. 39(2).
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- An annotated list of the marine algae of B.C. and Northern Washington. Robert F. Scagel. Bull., Nat. Mus. Canada, 150: 289 pages. 1958.
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- Intercultural Relations of Great Whale River, Hudson Bay. A. Balikci. Contributions to Canadian Anthropology.
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- Medicine Men of the North Pacific Coast. C. M. Barbeau. Bull., Nat. Mus. Canada, 152:95 pages. 1958.
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- Preliminary Archaeological Investigations in the Sierra de Tamaulipas, Mexico. Richard S. MacNeish. Vol. 48. Part 6. Transactions, American Philosophical Society.
- A Discussion of Ekholm's "Regional Sequence in Meso-America and their Relationships". Richard S. MacNeish. Middle-American Anthropology, Pan-American Union, Social Science Monographs, No. 5, Washington, D.C.
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- A Comparison of Serological and Somatometrical Methods Used in Differentiating between certain East African Racial Groups, with special reference to D^a Analysis. L. Oschinsky. Sankhya, The Indian Journal of Statistics, Vol. 20, Parts 1 and 2, Sept. 1958, Calcutta, India.
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- A Preliminary Account of 1958 Field Research. William E. Taylor, *American Antiquity*, Vol. XXIV, No. 4, Part 1.
- Archaeology in the Canadian Arctic. William E. Taylor. *Canadian Geographic Journal*, Sept. 1958.
- Report of Archaeological Survey in the Illinois River Valley and Ceramics of the Irving Sites. William E. Taylor in J. C. McGregor's "The Poole and Irving Villages", University of Michigan.
- L'Indien de la forêt boréale élément de la formation écologique. Jacques Rousseau. Ottawa, 1958. Queen's Printer.
- Botany. *Encyclopedia Canadiana*, Vol. 2. 26-29. Jacques Rousseau.
- Snowshoe. *Encyclopedia Canadiana*, Vol. 9, 347-348. Jacques Rousseau.
- Toboggan. *Encyclopedia Canadiana*, Vol. 10, 91. Jacques Rousseau.
- Ces gens qu'on dit sauvages. *Les Cahiers des Dix*, No. 23. Jacques Rousseau.
- L'identité de l'établissement d'Hévreuil. *Revue d'Histoire de l'Amérique française*. Vol. 12, 596-597, 1959. Jacques Rousseau. Hakluyt et le mot esquimau. *Revue d'Histoire de l'Amérique française*, 12, 597-601, 1959. Jacques Rousseau with D. B. Quinn.

Appendix G

Annual Report of the Commissioner of the Northwest Territories 1958-59

Commissioner—R. G. ROBERTSON

Legislation

The Council of the Northwest Territories met twice during the year, from July 14-18, 1958, and from January 26-February 3, 1959.

Twenty bills were passed, among them ordinances providing for the establishment of credit unions and cooperatives, and for the sharing of unemployment assistance expenditures with the Federal Government. Authority was given the Commissioner under the Loan Agreement Ordinance (1958) to borrow \$800,000 to meet the heavy capital expenditures involved in the expansion of educational facilities. The Game Ordinance was amended to permit the sport hunting of buffalo.

John Parker, the elected member for Mackenzie North, resigned to become Judge of the Territorial Court of the Yukon in June, 1958, and was replaced by E. J. Gall, of Yellowknife. R. A. Bishop resigned as Secretary of the Council and was replaced by F. B. Fingland. Aklavik (East 3) was re-named Inuvik.

Economic Activity

The rate of economic expansion in Canada as a whole declined slightly last year and this was also the case in the Northwest Territories. However, a good deal of interest was shown in the search for resources as evidenced by the greatly increased activity in oil and gas exploration.

The natural fur market operated at a level slightly lower than that of last year. Although prices for particular furs, such as white fox, muskrat and lynx, may rise, the general trend in fur prices is downward. The decline in the caribou herds continues, only slightly mitigated this year by an unusually large crop of calves.

Government construction in the settlements and municipalities increased over last year and was a major source of economic activity. Several large buildings such as the schools and hostels at Fort Smith and Yellowknife were completed, and substantial progress was made on the extension of the Mackenzie Highway to Yellowknife. The construction program at Inuvik proceeded satisfactorily and it is hoped that the major buildings will be completed next year.

There was a decrease in the number of mineral claims staked and recorded from the previous year. A total of 2,205 mineral claims were recorded in the Arctic and Hudson Bay Mining District which again was the most active area. There were fewer mining exploration companies active in all mining districts mainly due to low-price markets, although diamond drilling programs increased during the year.

Late last autumn a promising copper-nickel discovery was made about 75 miles north of Fort Smith which resulted in a minor staking rush to the area during the winter months.

The preliminary figures for the value of mineral production to December 31st, 1958, were \$24,791,516, which is an increase over the value of mineral production for the year 1957 which was \$21,400,615. Gold production increased from \$11,360,702 in 1957 to \$11,392,475 and pitchblende production at \$9,628,000 was greater than it has been for the past three years. This is mainly attributable to the production from an additional mine.

The number of quartz claims recorded in the Northwest Territories during 1958 totalled 2,293.

The increase in metal mining activity was far over-shadowed by the interest of oil and gas exploration companies in the potentialities of the sedimentary areas in the Northwest Territories. At March 31st, 1958, there were only 403 exploration permits issued in the Northwest Territories covering 21,439,160 acres, while at March 31st, 1959, there were 66,426,209 acres under oil and gas exploratory permit.

In the areas lying north of 70 degrees latitude, the oil and gas industry made representations that due to the shorter working season the period of the exploratory permit should be extended. Therefore, it was decided not to issue any further permits but if anyone were interested in acquiring oil and gas permits in that area a priority system would be established. Until the new regulations are promulgated for the area lying north of 70 degrees latitude, any interested party may claim a priority on the area of his choice providing that such area has not already been filed upon. By the end of March, 1959, applications for priorities covered 80,450,162 acres in the Arctic Islands. Oil and gas regulations were in the course of preparation at the end of the fiscal year dealing with potential oil lands under the territorial waters of Canada over which the Federal Government has responsibility for the disposal of oil and gas rights. The new Territorial Oil and Gas Regulations which came into effect in August, 1958, were designed to provide an incentive for additional exploration work and development work, and at the same time protect the public interest by the establishment of a Crown Reserve system for leasing at the end of the permit stage.

During last summer's field season, there were approximately 22 private field parties working in the Northwest Territories, most of them in the Mackenzie Delta area or to the west of it. These parties were supplied with fixed-wing aircraft and some 18 helicopters were engaged moving fly-camps and local parties about the country. Eight wildcat wells were drilled during the past winter and of these wells, all were abandoned except one which has been suspended.

The fur trapping industry in the Territories, after showing a considerable increase in 1954-55, declined in the crop year 1955-56 and again in 1956-57. In 1956-57, a total of 256,887 pelts with an estimated value of \$732,000 were exported compared with 366,000 pelts with an estimated value of \$806,000 for 1955-56. There was little change in 1957-58 when 257,183 pelts were taken with an estimated value of \$735,000. Muskrat prices were down and white fox showed a slight drop in price. The 1958-59 fur market showed signs of strengthening, principally in white fox, muskrat and lynx.

The Great Slave Lake fishery yielded 5,763,000 pounds of white fish and lake trout during the summer of 1958 (June-September), and the winter of 1958-59 (December 1958-March 1959). This was a decrease of 378,000 pounds from the 1957-58 catch and is well below the quota of nine million pounds.

Workmen's Compensation

During the year an X-ray Film Library was established in the Workmen's Compensation Office at Edmonton to serve as a central filing depot for all chest X-ray films taken in the Territories. This essential record will provide a history of workmen that will assist the Referee in adjudicating future claims for compensation for silicosis.

The enforcement of the Ordinance was again directed to non-resident contractors taking workmen to the Northwest Territories for short periods of employment. The number of employers in this class engaged in exploration for oil and gas and in the sub-trades of construction was considerably increased, resulting in the granting of 101 Exemption Orders as compared to 59 in 1957. At the same time, there were 276 insured employers in 1958 compared to 271 in 1957.

The cost of operating the Workmen's Compensation Office increased from \$15,585 in 1957-58 to \$17,756 in 1958-59 due principally to the higher rental charged for accommodation in the Federal Public Building. Some relief from these costs will result in the new apportionment of costs whereby the Federal Government will pay 40 per cent and each of the Territorial Governments 30 per cent of salaries, accommodation rental and office services. The revenue from assessments and exemption fees showed a decline from \$20,069 in 1957-58 to \$16,254 in 1958-59. This reduction in income is due chiefly to the loss of the accounts of two Crown Corporations, the Eldorado Mining and Refining and the Northern Transportation Company which are now covered by the Federal Government Employees Compensation Act, and to the fact that there are no longer any large operations in DEW Line construction.

Comparative figures for the number of accidents and payments by insurers for the last two years are:

	1957	1958
Non-compensable accidents	670	542
Compensable accidents	454	384
Compensation payments	\$319,138.60	\$297,857.68
Medical and hospital payments	\$126,975.95	\$142,659.80

Health

The enactment of the Hospital Insurance and Diagnostic Services Act by the Parliament of Canada and the agreements made between several provinces and the Federal Government had its effect on developments in the field of health in the Northwest Territories. An interdepartmental committee consisting of representatives of the Federal Departments of Health and Welfare, Finance, and Northern Affairs and National Resources was of the opinion that a hospital insurance program could be developed in the Northwest Territories within the terms of the Federal Act. The committee also prepared cost estimates for the financing of a program.

The Council, at the January 1959 Session, approved in principle the recommendations of the interdepartmental committee and recommended that the program come into operation on the 1st of January, 1960. The program will be financed from general tax revenues and a per diem co-insurance charge. The benefits immediately apparent to residents of the Territories will be that the cost of general hospital care of qualified residents will no longer be the responsibility of the individual regardless of whether this care is incurred in the Territories or outside. As well, territorial hospitals will have a guaranteed income and they will not have to be as concerned with financial matters as formerly and will be able to devote more attention to raising the level of hospital standards.

In May 1958 accounts were issued for the first time to non-indigent persons receiving medical attention from Northern Health Services personnel in the Territories who did not pay for the services at the time they were received. This program, which is in conjunction with the cost sharing agreements between the Territorial Government and the Department of National Health and Welfare for Northern Health Services' facilities, is applicable to all non-indigent persons except those who are residents and are receiving free medical services for tuberculosis, cancer and mental disease. Revenue received in the eleven month period from May 1st to March 31st amounted to \$11,400. It is estimated that this revenue will increase during the coming year to approximately \$20,000.

Under the National Health Grants Program, Salk Vaccine was provided free of charge to all residents of the Territories under forty years of age except in isolated communities where it was made available to the entire population. Public Health training was provided to four graduate nurses who will be employed in the Territories upon graduation. As part of the Northern Health Services survey, a T.B. case-finding survey was conducted throughout the Territories. The Alberta Co-ordinating Council for Crippled Children undertook a case-finding survey to allow crippled children to receive treatment and rehabilitation. Other programs under the Health Grants Program included the hydatid survey, dental care for school children and cancer control.

There was a total of 864 live births during 1958, of which 222 were Indian, 381 were Eskimo, and 261 were others. There were 280 deaths during the year, 45 Indians, 184 Eskimo and 51 white. In addition, there were 136 marriages.

Welfare

Relief assistance to indigents increased substantially during the year. This increase was particularly noticeable in the two Municipal Districts of Hay River and Yellowknife. The slight recession during the winter and spring of 1958 appears to be the main factor for this increase, but the increase in the professional Social Work staff in the Territories also appears to have been a factor.

At March 31st, 1959 there were 124 recipients of Old Age Assistance compared to 103 at the same time in the previous year. Eighty-two of these were Treaty Indians, 29 were Eskimos, and 13 were other than Indian and Eskimo. There were 28 recipients of Blind Persons Allowance at March 31st, 1959 compared to 27 at March 31st, 1958.

Nine of these were Indian, 18 were Eskimo, and one was other than Indian and Eskimo. Twelve persons were receiving Disabled Persons Allowance on March 31st, 1959 compared to 6 the previous year. Five were Indian, 6 were Eskimo and one was other than Indian and Eskimo.

A new Superintendent of Welfare for the Mackenzie District took up her duties in Fort Smith during the year. The responsibilities of the Superintendent will include the review of existing practices and policy and the development of new services and facilities to provide residents of the Territories with a higher level of welfare services.

Education

Day Schools were operated throughout the Territories by the Department of Northern Affairs and National Resources and the Territorial Government reimbursed the Federal Government on a per pupil cost basis for non-Indian and non-Eskimo children in attendance.

The Sir John Franklin School (a new combined high and vocational training school) and Akaitcho Hall, a 100-pupil residence, were officially opened in Yellowknife on September 29th. Prior to this a new 100-pupil residence at Fort McPherson was opened on September 12th. These are the second and third of the new Federal-Territorial financed school and hostel projects to come into operation. The first, a 200-student residence, was opened at Fort Smith in January, 1958. Plans call for a new 30-classroom school and two 250-pupil residences to open at Inuvik in September, 1959.

Residential schools were operated by the Anglican Church at Aklavik and by the Roman Catholic Church at Fort Providence and Aklavik. The residential schools at Aklavik will close concurrently with the opening of the new school and hostels at Inuvik. However, a 6-room government day school will continue to be operated at Aklavik to take care of those who do not make the move to Inuvik.

At Port Radium, Consolidated Discovery Mine, and Norman Wells, schools were operated jointly by the interested mining companies and the Territorial Government. The companies provided classroom accommodation and living accommodation for the teachers. The Territorial Government was responsible for school supplies and the salary and allowances of the teachers.

Yellowknife Public School District No. 1 continued to operate a 15-classroom elementary school and Yellowknife Separate School District No. 2 continued to operate a 6-classroom school. These are the only organized school districts in the Territories.

School enrolment at March 31st, 1959, compared with March 31st, 1958, was as follows:

	Eskimo		Indian		Others		Totals	
	1958	1959	1958	1959	1958	1959	1958	1959
Day Schools (Govt.).....	360	1015	431	684	726	974	1517	2673
Hospital Schools.....	30	29	95	60	10	7	135	96
Residential Schools.....	154	145	318	103	116	67	588	315
Company Schools.....	60	0	2	7	35	36	97	43
School Districts.....	0	0	17	45	427	397	444	442
TOTAL.....	604	1,189	863	899	1,314	1,481	2,781	3,569

Government hostels or student residences are operated at the following locations:

Yellowknife	100 pupils
Fort McPherson	100 pupils
Fort Smith	200 pupils

An 80-pupil hostel owned and operated by the Roman Catholic Church at Chesterfield Inlet has been purchased by the Federal Government and will be operated as a Government institution commencing in August, 1959.

The Territorial Government again provided a scholarship of \$1,200 to the student obtaining the highest mark in the final Grade XII examinations. The scholarship continues in like amounts for four years subject to satisfactory progress being made by the student. Three students are at present attending the University of Alberta under the plan.

Progress was made in the development of a special curriculum for schools in the Territories. Community film programs including educational films for schools were sent out on a monthly basis to settlements in the Mackenzie District, and periodically, depending on transportation facilities, to other settlements in the Keewatin and Franklin Districts.

The Vocational Training Program, designed to prepare trainees for gainful employment, was further expanded with the opening of the Sir John Franklin School at Yellowknife. Some 75 persons of non-native status either completed their training or were continuing training through local training programs, apprenticeship training, on-the-job training and training in vocational schools. Several received their training outside the Territories at such centres as Edmonton, Calgary and Winnipeg.

Game

The conservation of the mainland barren-ground caribou population continues to be a matter of immediate concern. As a part of the overall conservation program, funds were provided for an intensified wolf control program. During the 1957-58 program, 1,275 wolves were taken. Preliminary figures for the 1958-59 program indicate that despite increased control measures only 800 wolves were killed. This "diminishing returns" effect is an indication that the program has been successful in reducing the wolf population.

Municipal Affairs

The development plan of Fort Smith was brought closer to realization through the acquisition by the Territorial Government of land for re-development as residential, commercial and industrial subdivisions. Continued co-operation and assistance were received from the Chief Architect of Central Mortgage and Housing and his staff on layouts and land use. Private applications for subdivisions and rezoning were considered and dealt with. Construction of a water and sewer system for the town, to be financed on a joint Federal-Territorial basis, was commenced with completion due in 1959. Traffic Control Regulations and street names were established for Fort Smith by Commissioner's Order. The Local Advisory Committee made up of local citizens met regularly and gave valuable advice and assistance to the appointed Administrator in matters of local concern. The local ratepayers contributed under the Local Improvement District Ordinance to the expenses of road construction, road maintenance, street lighting, fire protection and an experimental insect control program.

In the Local Improvement District of Fort Simpson, the program of road construction and maintenance, street lighting and local fire protection was continued. The Local Advisory Committee met to approve the annual budget which involves contributions by the local ratepayers under the Local Improvement District Ordinance. A sewer and water system is under construction for Federal installations, with provision for local connection on an optional basis.

At Inuvik, substantial progress was made on the Federal construction program and increased interest was shown by private individuals and corporations in establishing at the new site. All private applications to build are handled under the Territorial Site Control Regulations. Private building plans examined included plans for a large Hudson's Bay Company store, a hotel, two private garages, and two residences in the serviced area. Some 60 lots have been reserved by Aklavik residents wishing to move to Inuvik. A proposal from an Aklavik resident for a telephone franchise at Inuvik is under consideration. Traffic Control and Sanitary Regulations have been issued.

The Frobisher Bay Development Area was established and Site Control and Traffic Control Regulations issued.

Grants to the Municipal Districts of Yellowknife and Hay River were administered and annual budgets and financial statements were reviewed. A territorial loan to the Municipal District of Hay River was made for the acquisition of a fire truck. An exploratory program for a safe water supply was undertaken at Hay River.

Fire prevention activities included the appointment of Mr. D. J. Ford, who is a specialist in fire prevention, as Territorial Fire Marshal, and the appointment of Assistants to the Fire Marshal at various points. Fire fighting equipment was furnished to a number of settlements. The construction and maintenance of local roads and sidewalks, and provision of street lighting was undertaken in a number of small settlements.

Finances

Territorial revenues and expenditures in 1958-59 as compared with 1957-58 were as follows:

	1957-58	1958-59
Revenue	\$ 2,131,066	\$ 3,008,235
Expenditure	2,654,792	2,992,946
Surplus		\$ 15,289
Deficit	\$ 523,726	

At the close of the fiscal year cash in the Northwest Territories Revenue Account amounted to \$705,783 as compared with \$690,493 at March 31st, 1958. Of this amount \$64,371 is being held as a reserve for Workmen's Compensation.

It should be noted that the revenue figure for 1958-59 includes \$600,000 borrowed from the Federal Government. Without this loan there would have been a deficit for the year of \$584,711 and a balance in the Northwest Territories Revenue Account of \$105,783.

Appendix H

Annual Report of the Commissioner of the Yukon Territory 1958-59

Commissioner—F.H. COLLINS

Legislation

The elected members of the Territorial Council are: J.O. Livesey, of and representing the Carmacks-Kluane district, Speaker; G.O. Shaw, of Dawson and representing the Dawson District; J. Smith and C.D. Taylor, Whitehorse, representing Whitehorse West and Whitehorse East; and R.L. McKamey, Mayo, representing the Mayo district. The appointed officers were H.J. Taylor, Clerk of the Council, and D.S. Collins, Legal Adviser.

Council sessions were held April 9-May 5 and Oct. 15-Oct. 30, 1958. At the first session 27 ordinances were passed and at the second four. Among the important legislation were ordinances providing for government control and sale of alcoholic liquor and respecting public health, game conservation, the safe operation of mines, the handling and use of explosives, the maintenance of parents, deserted wives and children, public printing, and pawn brokers and second hand dealers. Amendments were passed to the Old Age and Blind Persons Allowance, the Disabled Persons, the Business Licence, the Workmen's Compensation, the Insurance, the Elections, the Motor Vehicles, the Fur Export, the Steam Boilers, the Saw Logs Driving, the Evidence and the Reciprocal Enforcement of Judgments Ordinances.

Yukon Forestry Division

Protection of the forests from fire is one of the chief functions of the Yukon Forestry Division. The organization is supervised by a forest officer and comprises during the fire season, an operational staff of 15 and a clerical and maintenance staff of three. Headquarters are in Whitehorse where the Chief Warden and four-man suppression crew are located. A lookout is stationed on Haeckel Hill which commands a view of the Yukon Valley from Marsh Lake to Lake Laberge. Wardens are stationed at Teslin, Haines Junction, Mayo and Dawson and during the fire season additional stations are manned at Watson Lake, White River and Carmacks.

The weather conditions of the 1958 fire season and the period preceding it were the most adverse experienced since organized forest fire control was introduced to the Territory. The winter of 1957-58 was mild and snowfall was light. April was warm and much of the snow disappeared although no run-off occurred. Early May, on the other hand, was cool but dry and the remainder of the snow disappeared leaving the ground very dry. When warm weather came in late May a high hazard developed immediately. In the Whitehorse area during May, June and July the precipitation was about one-third normal, the temperature averaged over four degrees higher than normal and the total wind mileage was twenty per cent greater than normal. Together these factors combined to create very high fire hazards and render the control of the forest fires which broke out extremely difficult. The Whitehorse area, while perhaps experiencing the most severely adverse weather conditions, was typical of the Territory as a whole except for the Dawson and White River areas, which, after the beginning of July, received adequate rainfall.

The losses suffered from forest fires and the cost of forest fire suppression were both very much greater than in previous years.

Number of Fires and Fire Losses	1958	1957
Number of fires reported	96	88
Total area burned (acres)	1,554,402	116,246
Total merchantable timber burned (acres)	181,098	13,892
 TOTAL LOSS	 \$ 1,501,532.00	 \$46,727.50
Loss of Property other than timber	\$ 142,296.00	\$ 500.00
Cost of Forest Fire Suppression	\$ 190,823.00	\$24,332.00

Campfires were the most important cause of forest fires causing 38 of the 96 fires. Other important causes were: Lightning—25 fires; Smokers—9 fires; Settlers—2 fires; Incendiary—1 fire.

Tourist Campgrounds and Lunch Stops

At the beginning of the year there were 10 tourist campgrounds and seven lunch stops maintained along the Alaska Highway and picnic areas maintained at Kathleen Lake, on the Mayo Road, and Otter Falls on the Aishihik Road. During the year three of the lunch stops on the Alaska Highway were converted to tourist campgrounds through the addition of a cooking shelter. Work on this project was interrupted and not fully completed because of the forest fires. Work was also begun on the development of a lunch stop at Dawson City on the west side of the Yukon River.

All the tourist facilities were heavily patronized during the summer months and plans for the extension and improvement of these facilities are in progress.

Economic Activity

During the year 98 oil and gas exploratory permits covering 4,947,035 acres were issued in the Yukon Territory.

Total value of mining production declined slightly during 1958. Total value of mining production was \$11,772,818 compared to \$14,111,798 in 1957. Production and values of production of the various minerals were as follows: gold, 69,210 ounces, \$2,351,756; silver, 5,860,499 ounces, \$5,091,015; lead, 21,539,447 pounds, \$2,446,084; zinc, 14,527,390 pounds, \$1,577,675; cadmium, 162,706 pounds, \$247,313; coal, 4,544 tons, \$58,975.

In the Whitehorse district there was increased interest in placer mining. Production increased from 1,635 ounces to 2,608 ounces. There was a slight increase in prospecting activity but total revenue from mining, which amounted to \$16,053, was the lowest since 1952. While several minerals in current demand are known to exist in the Yukon, there is apparently less incentive for prospectors to get out into the field.

In the Dawson district the number of placer mining claims in good standing fell from 1,262 to 1,223 during the fiscal year, while the number of quartz claims fell from 577 to 478. Placer claims in the Mayo district increased from 79 to 86 and the number of quartz claims in good standing dropped from 1,324 to 1,113.

General economic activity, as reflected in the activity, production and revenue from mining, lands and timber, was down considerably from 1957-58.

Territorial Secretary's Department

The number of persons receiving Old Age Assistance in the 65-69 age group has not changed greatly during the past year. There were a number of additions but also a number of recipients transferred to Old Age Security. As at March 31st, there were 129 Indians and nine white recipients.

There were four recipients of Blind Persons Allowances and two claims for Blind Persons Allowances.

The Births, Marriages and Deaths recorded in the Yukon over the past two years are as follows:

		<i>Births</i>		<i>Marriages</i>		<i>Deaths</i>	
		1958	1959	1958	1959	1958	1959
White Status		404	392	99	102	66	68
Indian Status		91	82	11	7	28	23
		<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
		495	474	110	109	94	91

There were 322 business licences and 12,507 motor licences issued during the year.

The total assessment for the past year decreased \$7,500 from the previous year. This was caused by a sale of one piece of property to the Federal Government and a reduction of assessment by the Court of Revision. New additions failed to compensate for the deletions by the above amount.

The Court of Revision was held at the usual time, the second Tuesday in January, and granted two appeals which resulted in a net decrease of some \$10,300 of property assessment.

The Territory now has the services of a Boiler Inspector who is retained on a year round basis. During the past year, the Inspector spent approximately one month on a full time basis inspecting boilers in the Territory.

A system of written test was arranged for applicants for steam engineer's certificates in the various categories. It is expected that all steam engineers in the Territory will be examined in this manner during the coming year.

There were 17 local companies incorporated and 27 companies whose head offices are outside the Territory licensed and registered under the Companies Ordinance. Three societies were incorporated under the Societies Ordinance. At the close of the year the register contained 270 companies of which 101 were incorporated in the Territory, and 34 societies, all in good standing.

Revenue for the fiscal year 1958-59 was as follows; incorporation of companies \$3,199; licensing and registering extra-territorial companies \$3,440; incorporation of societies \$33; annual returns and miscellaneous \$266.10.

Department of Health and Public Welfare

Due to the increase in social and child welfare problems in the Territory and the necessity for expanding our welfare services to meet changing conditions and existing needs, a professional social worker was employed on November 1, 1958. This social worker made 336 outside visits and interviewed 86 cases.

The annual chest X-ray survey was carried out during the summer months through the co-operation of the Indian and Northern Health Services of the Charles Camshell Hospital (Edmonton). Equipment and two technicians were supplied by the Camshell Hospital with the nurses and staff of the local division assisting. During the survey 4,906 persons (of white status) were X-rayed as compared with 4,470 X-rays taken during the 1957-58 survey, an increase of 436. Chest X-rays authorized by the local division of I. and N. H. S., and taken at Territorial hospitals of T.B. suspects, contacts, and followups on former sanatorium patients, numbered 140. An additional 904 had chest X-rays taken in territorial hospitals at the direction and upon the recommendation of the local doctors.

As there is no radiologist in the Yukon, the Territorial Government has an arrangement with a chest specialist in Edmonton for the reading and interpretation of all chest X-ray films taken in the Territory. X-ray readings for the year, including the X-ray survey, totalled 5,950 at a cost of \$4,539.50.

During the year three cases of tuberculosis were treated locally by confinement in the local hospital and anti-T.B. drugs. All three cases were discharged after short-term confinement, and treatment continued at home with bed rest and drug therapy. Two cases discharged after sanatorium confinement required a short period of drug therapy following their return home.

The total expenditure for this service in the fiscal year 1958-59 for confinement and treatment, medical and special fees, transportation, drugs, etc., amounted to \$47,492.05, as compared with a total expenditure of \$51,750.32 for the fiscal year 1957-58.

Two indigent persons (females) who had received treatment the previous year at the B.C. Cancer Clinic required terminal care in the local hospital. The total expenditure for this service for the year was \$356.

During the year in review 9 persons (6 male and 3 female) were adjudged insane by the Magistrate's Court, and were committed by Order of the Commissioner to the Mental Hospital at Essondale, B.C. Of this number, 6 persons were Yukon residents, and 3 persons had not gained Yukon residence at the time of their committal.

The total overall expenditure for this service (hospitalization, medical fees, transportation, etc.) amounted to \$48,169.61.

Emergency assistance was granted to a number of transients who became stranded in the Yukon and who could not obtain employment. Minimum assistance was granted to assist them in reaching the closest welfare agency in their home province. Assistance was also granted in a number of cases to persons and families who, because of indigent circumstances, were obliged to apply for public assistance before they had

gained twelve months' residence in the Territory. In all cases the responsible province agreed to reimburse the Territory for the assistance granted. Social assistance cases for which the Territory assumed responsibility numbered 218, of this number 37 were family units and 181 were individuals.

Throughout the year an average of 65 social allowances were issued each month, mostly to senior citizens where only income is Federal Old Age Security or the Territorial Old Age Assistance Pension.

A number of unskilled transient workers came to the Yukon hoping to find employment and usually these men arrived in the Yukon with very little funds. When employment could not be found and his funds became depleted, the non-resident applied for public assistance. It was usually in the best interests of the indigent person, as well as the Territory, to repatriate the non-resident to his home province or to the closest welfare office in his province. Most of the stranded non-residents were young men who had secured free rides up the Alaska Highway, and to these individuals a minimum allowance was granted for their subsistence while returning to their home province in the same manner in which they travelled to the Yukon. In other cases, the non-resident was returned to his province via bus.

Assistance was also granted during the year to families who moved to the Yukon from one of the provinces, and who, because of indigent circumstances, were obliged to apply for assistance before they had gained Yukon residence.

The total expenditures for the social assistance program in the fiscal year 1958-59 amounted to \$86,627.87 as compared with a total expenditure of \$50,474.88 for the previous fiscal year. This increase of \$36,152.99 is due to the increase in the number of social assistance cases, and the higher costs of hospitalization.

There were 28 children under care at the end of the year and 11 children placed for adoption. Four adoption placements were made by the British Columbia Child Welfare and one by the Alberta Child Welfare; two children became wards of the Yukon Superintendent of Child Welfare and four were surrendered by their mothers to the Superintendent and placed in adoptive homes.

Public premises were regularly inspected by the Sanitary Inspector who travelled 14,022 miles in the Territory in the discharge of his duties. General conditions in Whitehorse are improving slowly as additional premises were connected to the sewer and water systems. Working with the Local Board of Health in Whitehorse, many old shacks have been condemned as unfit for human habitation. This work is progressing favourably. Conditions in Dawson have improved considerably both in construction and general cleanliness.

Some 2,000 inspections were made, 241 notices issued, 161 complaints investigated and 38 water samples taken.

Workmen's Compensation

The number of employers operating in the Territory has remained stable. The number of accidents has decreased from 725 to 673 with only 18 cases referred to the Referee for adjudication.

Net assessment for the year was \$9,030.58 while the fee paid to the Referee was \$2,132.93.

There was 673 accidents reported: 469 non-compensable; 189 temporary disability; 12 permanent disability and three fatalities.

Medical expenses totalled \$79,144.91 and compensation payments \$112,595.54, both showing a slight increase over last year.

The Workmen's Compensation Ordinance is administered by the Workmen's Compensation Officer who is located in Edmonton. He performs the same function for the Northwest Territories as well as carrying out the duties of Agent, N.W.T. Administration.

Education

Education in the Territory is administered by the Superintendent of Education. There are 16 schools in operation employing 76 full time and one part time teachers at the end of the school year, June 30th, 1958, which number was increased to 81 full-time and 1 part-time teachers employed on the 31st March, 1959. Of the schools, one is a Separate School operated at Dawson on a fee basis by the Sisters of St. Anne;

another, Christ-the-King School at Whitehorse is a Territorial school but is operated as a Separate School on a fee basis by the Sisters of Providence. The others are Territorial elementary and-or high schools. Total enrolment at September 1st, 1958 was 1,877 with an average daily attendance of 1,688.

The Department of Education worked closely with the Yukon Film Society in the operation of a Yukon Film Library distributing educational films in the Territory. The Yukon Film Library contains over 250 films and 200 film strips. The number of shows over the past year has increased from 2,017 to 2,701; the total audiences have increased from 35,677 to 39,807.

The following new buildings were completed during this period: a seven-classroom school, including an auditorium-gymnasium at Dawson; a four-classroom school at Elsa, plus teachers' suite; a two-classroom school plus teachers' suite at Haines Junction; and a one-classroom addition to the Watson Lake Wye School.

Construction of the Selkirk Street Elementary School in Whitehorse, which consists of eight classrooms plus a small auditorium-gymnasium is proceeding on schedule and the building will be ready for the term commencing September, 1959.

Plans are progressing to establish a Vocational Training School and accompanying dormitory facilities on the site at present occupied by the old Whitehorse General Hospital.

Of the 14 centres in the Yukon where schooling is available, only three are in a position to offer a program of studies embracing grades 1-12 inclusive. In the other 11 communities, a child's education ends at the grade 8 or 9 level, unless the parents can afford to send their boy or girl either to one of the high schools of the Territory or "outside".

Game Department

The 1958-59 fiscal year has been an active and successful year for the Game Department although total revenue decreased from \$24,899.71 for the fiscal year 1957-58 to \$21,065.48. This decrease is due in part to the new Game Ordinance which brought into effect a new scale of licence fees which were reduced in some cases.

Because of the 49 bait stations established during the winter of 1957-58 by use of aircraft, there have been 23 known wolf kills plus 3 wolverines and 5 foxes. Of the 18 bait stations established by road there were 20 known wolf kills and 8 wolverine kills.

During the months of January and February, 1959, there were 44 bait stations set out by registered guides and forestry wardens. The final results of the setting of these bait stations are not known. However, 16 wolves, 2 coyotes and 3 wolverines have been reported killed by other means.

Very few reports concerning elk were received by the Game Department this year. A small herd of seven or eight elk spent the winter near Pelly Crossing. A lone bull elk was seen at Mile 87 on the Mayo Road. During the year a number of reports were received about coast deer being sighted in the southern Yukon. Two reports of pheasants being seen and identified were received.

Buffalos have established a range along the Nisling River near its confluence with the Donjek River. On a special game survey flight made in March by the Canadian Wildlife Service, three buffalos were seen and several buffalo yards were observed along the Nisling River. A lone buffalo was shot and killed on the Alaska Highway. The culprit was apprehended by the Royal Canadian Mounted Police and convicted.

During the first part of July, 1958, reports were received that beaver were continuously plugging a culvert at Mile 1119, Alaska Highway. One beaver was live trapped and released in Sulphur Lake, 100 miles south on the Highway. No further trouble was experienced at this point. In mid-September, at four places which were miles apart on the northern portion of the Alaska Highway between White River and the border, beaver were reported threatening to flood the highway. Arrangements were made with trapline holders to have these beaver trapped. At Mile 125 on the Haines Road it was reported beaver were flooding a bay meadow. The complainant was given powder and caps to blow up the beaver's dam. A native trapline holder covering this area claimed he trapped all the beaver out of this stream last spring.

Game Taken—Season 1957-58

Non-resident:	Black Bear	Grizzly Bear	Caribou	Moose	Sheep	Goat	Predators
Spring Hunt (1958).....	7	4	—	—	—	—	—
Fall Hunt (1958).....	3	38	33	34	65	6	1 wolf 1 wolverine
Resident Hunters (1957-58)	59	16	239	188	53	8	19 wolves 6 coyotes
Registered Trappers (1957-58).....	40	12	539	161	17	1	44 wolves
	109	70	811	383	135	15	64 wolves 6 coyotes 1 wolverine

Migratory and upland game birds taken by resident and non-resident hunters and registered trappers— Season 1957-58: ducks 2712; geese 150; ruffed grouse 168; blue grouse 160; spruce grouse 912; Franklin grouse 59; sharptail grouse 35; ptarmigan 550.

A total of 63,352 fur bearing animals were taken by registered trappers, mainly muskrat and squirrel.

There are a total of 190 individual traplines and five group areas registered. Total revenue collected was \$21,065.48.

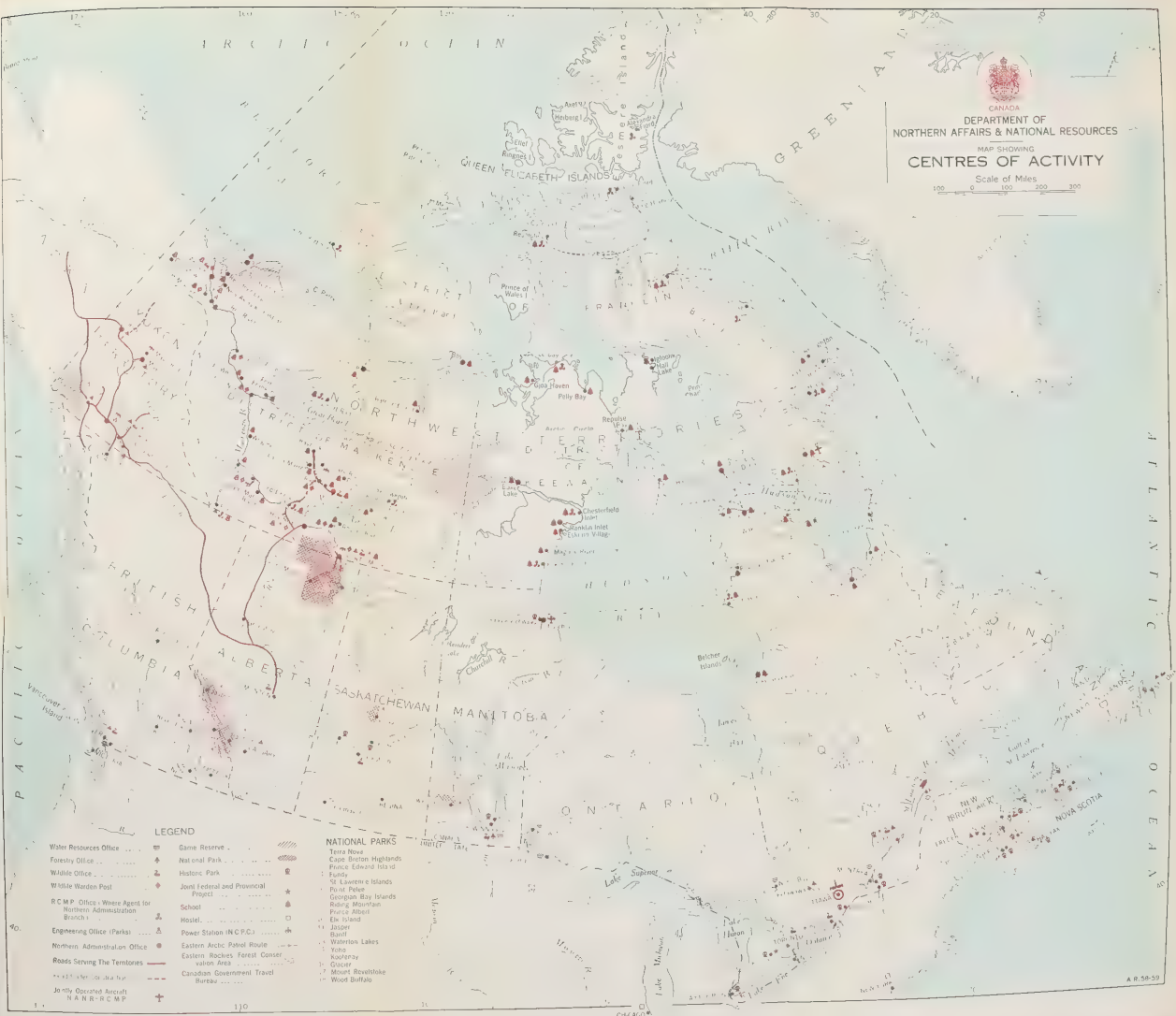
Roads, Bridges, and Public Works

The Whitehorse-Keno Road was opened to all traffic on May 24, 1958. The Carmacks ice bridge went out on April 27 and the Carmacks, Pelly and Stewart ferries were launched between May 16 and 20. The Carmacks ferry stayed in operation until November 15 while the Stewart and Pelly ferries were taken out of the water on October 10-12, then relaunched due to mild weather, and finally removed from service October 22. The Carmacks ferry was used by 10,929 vehicles, the Pelly by 7,042 and the Dawson ferry, which was in operation from May 19 to October 8, by 3,119.

For the first time in history the road from Dawson to 60 Mile was opened to wheeled traffic in April.

Re-construction of the Flat Creek-Dawson Road continued and 107 miles of the Canol Road repaired. The Canol Road is now open for 150 miles from Johnson's Crossing, Mile 837 of the Alaska Highway, to the junction of the Ross and Pelly Rivers. In the Mayo-Elsa district ten miles of road were built between Elsa and Sullivan Creek.

Building construction included garages, clerks' residences at Mayo and Dawson, a residence for the Dawson mining recorder and residence and an office for the Mayo mining recorder.



CANADA
DEPARTMENT OF
NORTHERN AFFAIRS & NATIONAL RESOURCES

MAP SHOWING
CENTRES OF ACTIVITY

Scale of Miles
0 100 200 300

Government
Publications



*Department of
Northern Affairs and
National Resources*

ANNUAL REPORT

FISCAL YEAR 1959-1960

Including an article
WILDLIFE IN MAN'S WORLD

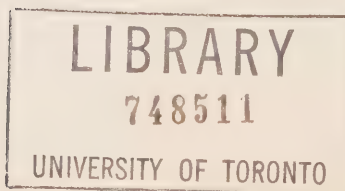
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OTTAWA, 1960

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*To His Excellency Major General Georges P. Vanier, D.S.O.,
M.C., C.D., Governor General and Commander-in-Chief of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the Annual Report of the Department of Northern Affairs and National Resources for the fiscal year ended March 31, 1960.

Respectfully submitted,

WALTER DINSDALE
*Minister of Northern Affairs and
National Resources*

*The Honourable Walter Dinsdale, P.C., M.P.,
Minister of Northern Affairs and
National Resources.*

Sir:

I have the honour to submit the Seventh Annual Report of the Department of Northern Affairs and National Resources, for the fiscal year which ended March 31, 1960.

During the year developments in Canada's north showed encouraging results in terms both of capital investment for the exploration and development of resources, and of progress in making available education and other services to the Eskimo people and northern residents generally.

During the fiscal year, continued active interest in the oil and gas potential of the Yukon and Northwest Territories was demonstrated by private companies willing to invest in scientific exploration over literally millions of acres, both on the mainland and on the Arctic Islands. Revised "Canada Oil and Gas Regulations" were prepared to encourage this investment and to protect the right of Canadian companies and the Canadian public to share in the expected discoveries. It is of course not possible, at this stage, to assess accurately the extent of oil and gas deposits, but discoveries of oil in the Yukon Territory, and of gas in the southern Mackenzie District, offer encouragement for the future.

Prospects for mineral development were shadowed by uranium marketing difficulties and by the imminent exhaustion of ore reserves at Port Radium, N.W.T., Canada's first uranium producer. However, these developments were offset by the recognition of a major tungsten deposit on the Flat River, N.W.T., which is likely soon to come into production. During the year studies were undertaken leading to the drafting of new "Canada Mining Regulations" which, like the Oil and Gas Regulations, will operate to encourage investment while protecting the interests of Canadians in northern mineral deposits.

Educational facilities in the Northwest Territories were substantially increased with the coming into operation of the new twenty-five classroom federal school at Inuvik. With this school, and other smaller ones, it was possible in 1959-60 to provide educational facilities to almost half of the Eskimo children of school age and to virtually all the children of other racial groups in the Territories. In five years, Eskimo enrolment has increased more than threefold. While this progress is encouraging, it should be borne in mind that to make education available to all children in the Territories, and to meet the expected increase in population of school age, it will be necessary to continue to plan for an average of twenty-five new classrooms each year.

The importance to northern people of new small industries has been stressed many times, and I can now report further progress. Last year, three new Eskimo co-operatives were established, and show every prospect of success. The development of a new Eskimo art form was marked by an exhibition of seal-skin prints and stone rubbings last spring; this excited a good deal of interest among dealers and collectors, and produced very worthwhile returns for the Eskimo artists. Both in the Arctic and in the Mackenzie District, the tourist industry offers substantial prospects for expansion and employment. The formation of the Northwest Territories Tourist Association, the success of the first buffalo sport-hunting season, and the opening of an Eskimo-operated tourist camp in the high Arctic, are evidence of progress during the year.

The National Parks Branch reports record attendance of 4.6 millions during the year. This represents an increase of almost ten per cent over 1958-59, and the trend shows no signs of change. A notable new development during the year was the restoration of an 18th century house in Quebec City—the first time that a building has been maintained because of its architectural as well as its historic interest. It is hoped that in the future it will be possible to extend this precedent to a few other structures of particular interest. Further progress was made with the development of Terra Nova National Park, and of facilities at other parks across the country. During the year, the National Parks Branch established a small education and interpretation service, to provide better information about special natural features of interest to parks visitors.

May I call your attention particularly to the special article on “Wildlife in Man’s World” which appears at the beginning of this report.

The Water Resources Branch was particularly occupied with provision of technical advice on proposals for using the waters of the Columbia River. Special problems were also investigated on other rivers, notably the Fraser, Yukon, Mackenzie, Saint John, and St. Lawrence.

During the year, agreement was reached on a program to expand the work undertaken by the Forestry Branch. This will, over the next five years, permit better service to the forest-based industries in Canada, through an increase in the research undertaken both in forestry and in the use of forest products, and the creation of a new field extension service to make the results of forest products research more readily available to the smaller units of the industries. The program of co-operation with the Province of New Brunswick and the forest operators there, to control the spruce budworm by aerial spraying, was extended for a further year. The Forestry Branch will, of course, cease to be a part of the Department of Northern Affairs and National Resources with the creation of a new Department of Forestry, as announced in the Speech from the Throne on January 14, 1960.

The problem of inadequate space, which has handicapped the National Museum for many years, approached solution in 1959-60 with the departure of units of other departments from the museum building to new quarters.

Plans are being made to use the space thus released for expanded exhibition of museum collections in both the natural history and human history sections.

Inquiries received by the Canadian Government Travel Bureau increased during the year to a record 759,000. This accompanied increased spending by foreign tourists in Canada, which reached about \$393 million in 1959—a gain of \$44 million over the calendar year 1958. The annual publicity campaign was highlighted by the preparation of “Invitation to Canada”, a 50-page booklet in full colour which probably has the largest circulation of any Canadian publication.

The Roads to Resources Program announced in 1958 began to show substantial results during the year. By the end of the period under review, agreements had been signed with nine of the ten provinces, and payments to them amounted to \$10,750,000. With the provincial share, this represents over twenty-one million dollars spent on new roads designed to open Canadian resources to economic development.

Plans for the “Resources for Tomorrow” Conference were also well advanced by the end of the year. The federal-provincial Steering Committee, had established the scope and aims of the Conference and a Secretariat, operating within the department but responsible ultimately to the Committee, had been established to make the necessary preliminary arrangements for the meeting in October 1961.

This letter suggests in a very summary way some of the more significant problems and achievements of the department during the year under review. I know you will agree with me that the progress reflects the competence of a capable and loyal staff. The department is most fortunate in this respect. I would like to record also the invaluable service provided to us by other government agencies—notably the Treasury Office and the Translation Office. Finally, the interest and encouragement expressed by the general public were of tremendous help; without this support, it would not be possible for us to work effectively in many of the areas of responsibility entrusted to this department.

Your obedient servant,

R. G. ROBERTSON,
Deputy Minister.

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Inserted at the back of this Report is a map showing the location of national and historic parks; game reserves; highway projects; forestry, water resources, wildlife, engineering and Northern Administration offices and posts, and other centres of departmental activity.

Department of Northern Affairs and National Resources *

Minister HON. WALTER DINSDALE, P.C., M.P.
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Assistant Deputy Minister E.-A. CÔTÉ
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**Secretary, Resources
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National Parks Service *Chief*—B. I. M. STRONG
National Historic Sites Division *Chief*—J. D. HERBERT
Engineering Services Division *Chief*—G. L. SCOTT
Canadian Wildlife Service *Chief*—W. W. MAIR

* As of November 1, 1960.

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Operations Division	<i>Chief Engineer</i> —J. D. MCLEOD
Hydraulics Division	<i>Chief Hydraulic Engineer</i> —R. H. CLARK

Forestry Branch

Director	J. D. B. HARRISON
Forest Research Division	<i>Chief</i> —D. R. REDMOND
Forestry Operations Division	<i>Chief</i> —H. W. BEALL
Forest Products Laboratories Division	<i>Chief</i> —J. H. JENKINS

National Museum of Canada—

Natural History Branch

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Assistant Director	CLIFFORD WILSON
Botany	A. E. PORSILD
Geology	J. F. HENDERSON (Hon. Curator)
Mineralogy	S. C. ROBINSON (Hon. Curator)
Palæontology (Vertebrate).....	W. LANGSTON Jr.
(Invertebrate).....	H. W. FREBOLD (Hon. Curator)
Zoology	A. W. F. BANFIELD

National Museum of Canada—

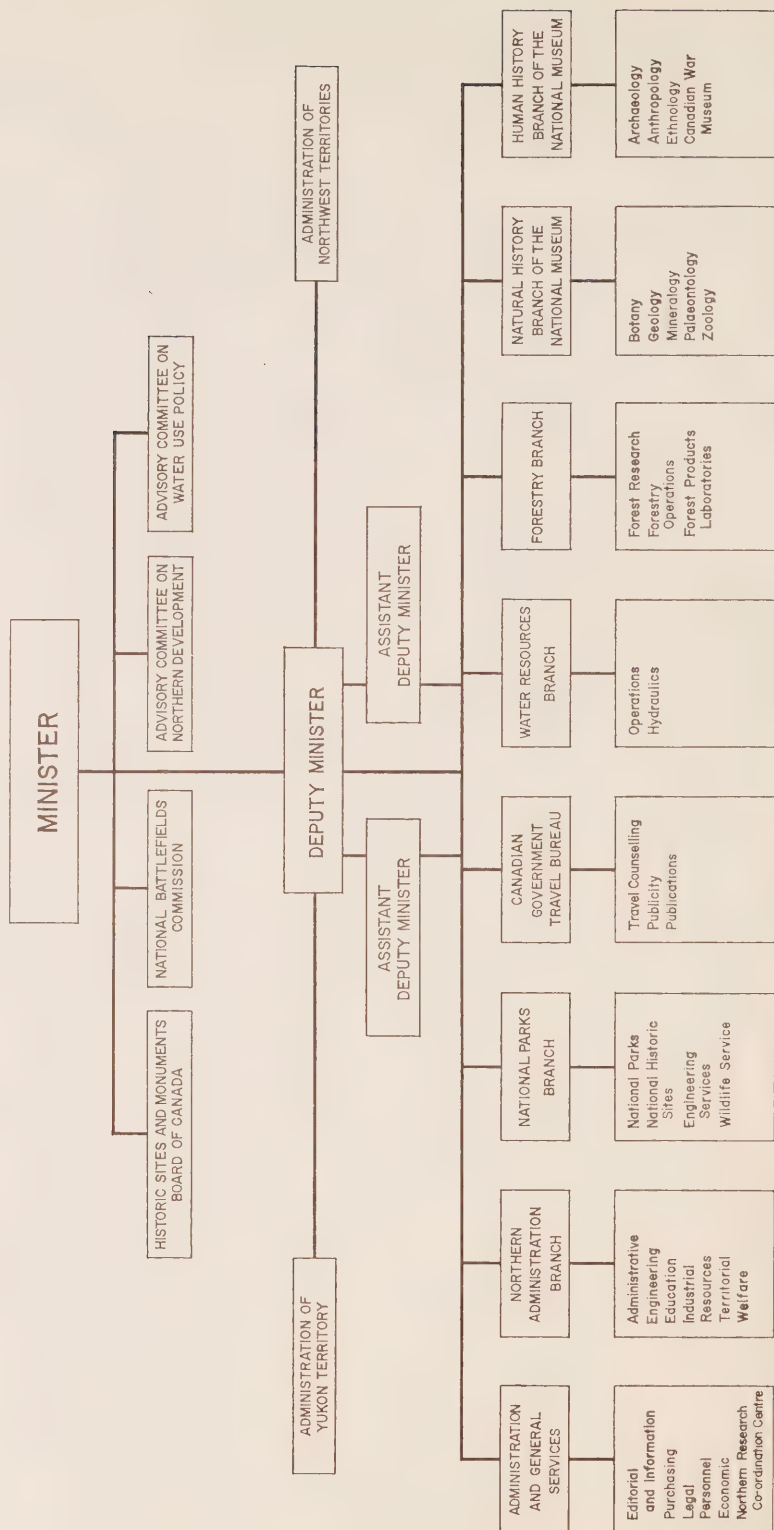
Human History Branch

Acting Director	L. S. RUSSELL
Archaeology	R. S. MACNEISH
Physical Anthropology	L. OSCHINSKY
Ethnology	T. F. S. McFEAT
Folklore	CARMEN ROY
Canadian War Museum	L. F. MURRAY

Canadian Government Travel Bureau

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Publicity, Films and Television	F. GALIPEAU
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DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES



Wildlife in Man's World

Wildlife is a part of the history of man. In hunting and trapping, he first asserted his superiority over other species and exercised his native resourcefulness and ingenuity. But the relegation of all other living things to inferior positions made their survival steadily more dependent on the activities, the desires and the convenience of man. The hunter, with his discriminating taste and large appetite, was a selective and wasteful killer who upset the system of natural checks and balances that had governed wildlife populations. Apart from such direct action, however, the capacity of man to appropriate more and more of the earth to his uses extended a pressure on wildlife that could not be resisted.

Until agriculture was developed, wildlife was the most important of all resources. It provided man with food and clothing as well as materials for weapons, tools and utensils. Game remained as an important supplement of diet and economy while the first attempts at agriculture were being made. Hunting occupied too firm a place in man's culture to be supplanted entirely. It moulded whole societies and created a lasting myth that the hunter was stronger and more manly than the land-tiller. The relatively unexciting routines of agriculture were left to the women at first and men took up the hoe and the scythe only when they had been convinced that agriculture also could be man's work.



As man developed socially, the pursuit of mammals, birds and freshwater fish, which once had been a necessity of existence, became instead a pastime. However it was in many places a pastime limited by law and custom to a few. Game is inseparable from its environment, and since under the feudal system only the nobility controlled sufficient land to establish private game preserves, hunting and fishing flourished primarily as aristocratic sports. Kings and nobles developed an elaborate technology for their sport and dignified it with ceremony and ritual. The code of sportsmanship was a natural counterpart of the code of chivalry.

Not all peasants accepted these restrictions. Many were willing to face severe penalties to stock their bare larders, a danger that made their exploits with trap and snare as sporting as those of the nobles with their packs of hounds, their stables of horses and their armouries of weapons. The poacher's ferret, like the lord's falcon, was a hunting symbol of the age.

Outside the civilized heartlands, wildlife maintained its elemental relation to human existence. But though primitive tribes hunted game to satisfy their basic wants, they almost always entertained beliefs that involved a respect for the animals they sought. Crude drawings on cave walls still express the awe and religious respect which men accorded to them. Power

and courage greater than the hunter's was attributed to the wild creatures he hunted, and in some tribes particular animals and birds were worshipped as deities. To-day, while we depend on other natural resources and the products of farms and factories for our material needs, some of this ancestral attitude survives. Our sophistication does not preclude our experiencing the same primitive thrill when we observe a wild creature in its natural surroundings. Though incapable of being assessed in any tangible form, the spiritual values of wildlife clearly influence our modern life and welfare.

When the first Europeans came to colonize the new lands of North America they found ample wild resources beyond their experience. Dense forests stretched back from the shoreline pierced by rivers rich in fish. Deer, bear, elk, wild turkeys and buffalo were plentiful, and overhead great flights of ducks, geese, passenger pigeons and other edible birds cleaved the air. We know now—human tendencies toward exaggeration and unscientific observa-

tion being what they are—that the first settlers overestimated the quantity of wildlife. But game and fish were certainly available in large numbers to people who had never had an opportunity to hunt and fish legally before.

Necessity forced the colonists to clear and break the land and sow crops. Wildlife, like the forests and the Indians, was in part an impediment if not a threat to the establishment of stable, peaceful settlements. But strange and disturbing as this new North American environment was to the new immigrant, he could

not fail to realize that here were new liberties that his former life had not offered. Here wildlife was free to anyone. No royal prerogatives or social distinctions restricted a man's right to hunt and fish as he pleased. This concept of wildlife as a resource for all people to use and enjoy remains today as a tradition in the public attitude to fish and game.

The impact of settlement on North America's wildlife was apparent from the early 17th century. The advance of agriculture inland from the eastern coasts reduced the wildlife in many regions. Species that endangered human life or crops were slaughtered, while others were dispossessed of their habitats; fur-bearing animals were trapped relentlessly to supply the large market in furs that had been established by European fashion.

The fur trade was of far-reaching significance in the uneasy relationship between wildlife and man on the North American continent. It placed the continent's fur-bearing animals at the mercy of voracious commercial demands. The beaver, the most eagerly sought animal, was trapped relentlessly so that the gentlemen of Europe might be properly hatted. Even in the early 1600's, the de Caens were shipping as many as 22,000 beaver skins a year from Canada to France. By 1743 the combined export by British and French fur traders was in excess of 150,000 beaver pelts a year, as well as large numbers of other skins like marten, otter and fisher.



The impact of the fur trade was felt for more than three centuries. In pursuit of new and unexploited fur resources the traders moved ever deeper into the land, acquiring in the process geographical knowledge that prepared the way for detailed exploration and settlement. The Indians and Eskimos became willing participants in the trade and with the more efficient weapons they obtained in barter for their furs they developed into destroyers of wildlife almost as efficient as the white men with whom they dealt.

In fairness it should be stated that not all fur-traders were unaware of the need to conserve game resources. The Hudson's Bay Company, for example, sold only single-shot rifles to Indians, and imposed restrictions on their fur take when it became apparent that the beaver population was being depleted. Nor were all Indians and Eskimos eager to trap more animals than they required to barter for essential trade goods.

While the trade had a great effect on exploration, and on economic and social development, its influence on the country's wildlife was far from salutary. Over-trapping was the vice of the fur trade, and its effect first became evident in a large decline in the beaver population. But there were other human activities that caused even greater destruction.

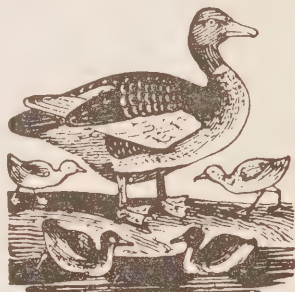
Agriculture, developing after the fur trade, often upset the soil cover and the natural plant growth on which the wild animals depended, and destroyed the specialized ranges and habitats of many mammals and birds. A mentality that justified the extermination of wildlife on economic grounds alone dominated the continent in the first half of the 19th century. At least, the fur traders were practical businessmen who realized that there were limits to the fur-bearing crop they harvested. No considerations of economics and common sense restricted the individuals who now seemed determined to destroy any wildlife species of value. They shot the buffalo for hides and tongues, wildfowl for the food market, birds with bright feathers for the milliners. The exploitation of wildlife that began with the fur-trade reached its climax in the slaughter of the last herds of plains bison in the late 19th century.

As the last loads of buffalo bones rolled eastward to be manufactured into fertilizer, a few thoughtful people took stock of the ravages that had been committed on nature's creatures by civilized man. It was a melancholy inventory. In less than 300 years men had destroyed more than they could replace. Birds like the passenger pigeon, the auk, the Labrador duck, and the Eskimo curlew had been totally destroyed; many hoofed animals, such as the bighorn sheep, the antelope and the musk-ox, seemed destined to become curiosities like the buffalo; fur seals, whales and walrus had been depleted. Not only had men nearly wiped out many creatures: they had also invaded the natural homes of the mammals, frightening away some species by their presence and then burning or cutting the forests, diverting and fouling the streams, changing the face of the land until little refuge was left for the wildlife to recover in relative security.

The men who scanned the dismal history of wildlife destruction were the continent's first conservationists. They evolved the principle that the renewable natural resources of wildlife, forests, water and land should be protected and that their use should, in some degree, be regulated—if for no other reason, so that man might be saved from the results of his own folly. Land and water, with their plants and wildlife, were recognized by a few as resources that were not unlimited, and as elements that should be dealt with, not simply for the benefit and appetite of the current generation, but in a fashion that would preserve them also for future generations.

Unfortunately, public opinion was slow to recognize the basic importance of these principles. The doctrines of the laissez-faire economists, the desires of the promoters and industrialists of the day, and the tradition of a limitless continent and open frontier were too strong a combination. It was not until late in the last century that the people, and hence their governments, began to give even an element of acceptance to the conservation of renewable resources and, as a part of that idea, to the protection of wildlife.

This was given a practical demonstration in Canada by passage of the first provincial game acts and the establishment of national parks. The first such Canadian park, now Banff National Park, was established in the Rocky Mountains in 1887. The primary purpose of national parks was not to protect wildlife alone. Birds and animals were considered only as an important part of a natural heritage that should be preserved for people to enjoy and appreciate. However, in effect, national parks are preserves in which species native to those areas live a free and protected life.



Outside the national parks, wildlife, with one exception, has been considered the legislative responsibility of the provincial and territorial governments. They enact, administer and enforce the laws and regulations respecting hunting, trapping, and other activities that affect wild mammals.

The exception is the federal responsibility over migratory birds resulting from the Migratory Birds Convention of 1916 between Canada and the United States. This treaty recognized the value of wild birds as food and as eaters of insects harmful to agriculture, and was directed at providing more effective protection than was possible under unco-ordinated provincial and state laws or under the laws of either country alone.

The Migratory Birds Convention listed those groups of birds that were to be protected by the two countries. Song birds, and others that helped the farmers by destroying harmful insects, were to be protected completely, and those that were game birds were safeguarded by hunting regulations revised each year.

Under the Treaty, the federal governments of Canada and the United States, after consultation with the states and provinces, set bag limits. Season

lengths can also be set within certain outside limits prescribed by the Treaty. Within that framework the states and provinces may add other waterfowl restrictions if they so desire. The prohibition of hunting on Sunday is an example of a provincial regulation that is found in some provinces, but not in all. Enforcement of the migratory bird regulations in Canada is the responsibility of the Royal Canadian Mounted Police.

In Canada federal-provincial wildlife conferences are held annually where delegates of provincial and federal game agencies meet to co-ordinate their activities. The success of the conferences has been shown by their expansion to include discussion of technical problems of game management, after the more routine details of co-ordinating waterfowl seasons have been completed. Subjects considered vary widely. Recently for example, they have included co-operative caribou studies, interprovincial shipment of live game, and the marketing of wild furs.

The Canadian Wildlife Service, which has developed from a migratory birds section in the National Parks Branch, has certain clearly defined and generally accepted responsibilities. Besides its work with migratory birds it advises other federal agencies on wildlife in federal areas and the territorial governments on wildlife in the Yukon and Northwest Territories, advises the national government generally on wildlife resources, and carries out related research.

As a result it acquires and distributes much information useful to the managers of the wildlife resource. Research findings are made available in a series of bulletins. Informative pamphlets are issued as the need arises. A series of translations of Russian papers on game management and research was instituted at the request of the Provinces. A new series of monographs has been arranged and will be issued as material becomes available. In contrast to the bulletins which report individual studies, the monographs are exhaustive treatises on wildlife subjects.

Forty biologists are employed by the Canadian Wildlife Service, about one-quarter assigned exclusively to research in Northern Canada and the remainder distributed among research projects in other parts of the country. The biologists work in three sections, concerned with migratory birds, mammals, and fish. The 20 ornithologists work in close association with the provincial governments, Ducks Unlimited (Canada), and the U.S. Fish and Wildlife Service. The mammalogists concentrate on the mammals of the national parks and the northern territories, cooperating closely with the territorial governments and other agencies. Because sport fishing is such an important activity in national parks, biologists carry out research in support of fish management programs and investigate special problems caused by blood-sucking insects and algae. These, if unchecked, create unfavourable conditions for swimmers, fishermen, and other parks visitors. Control measures must be handled carefully if wildlife is not to be harmed.

The provinces carry the chief responsibility in the management of wildlife resources. They develop and enforce the regulations which affect the majority of hunters, trappers, and freshwater fishermen. This involves

difficult problems in balancing the interests of sportsmen, naturalists, farmers and stockmen, and other groups of people with special concerns. It is not easy to secure the optimum economic and recreational benefits of wildlife for residents and their visitors.

Regulations cannot be effective without public understanding and sympathy. This implies that the rules must be based upon a solid foundation of practical information gained through research. It also implies effective public education programs.

Each province has established a department responsible for the administration of wildlife resources, often in association with other renewable resources such as forests. The progress made in wildlife management reflects the competence of these agencies and the effectiveness of their personnel engaged in research, enforcement, and education.

Provincial and federal wildlife activities are supplemented by a great number of private and public associations active in wildlife conservation. Fish and Game Associations composed of hunters and fishermen study and practice wildlife conservation with intense interest. Youth organizations, like

the Boy Scouts and the Girl Guides, introduce their members to wildlife conservation as part of their experience of the outdoors.



The Canadian Audubon Society fosters a deeper appreciation of bird-life and supports measures for its protection. Provincial Museums and the National Museum of Canada stimulate

public interest in animals, fish and birds and carry out basic biological and taxonomic research.

All these agencies—federal, provincial, or private—are closely concerned with aspects of wildlife management. Effective co-operation between them is essential in dealing with many wildlife problems. This co-operation has been achieved, not only through formal meetings like the annual Federal-Provincial Wildlife Conference, but also through the development of effective working arrangements to exchange information and co-ordinate activities.

Man has indeed moved a long way from the days when he looked on wildlife principally as something to be destroyed for his immediate gain. He knows that in 20th century Canada wildlife has modern values for recreation that are already of far reaching importance. With an immense potential for recreation—hunting, fishing, photography, nature study and just looking—the wildlife resource already has an economic value that tends to be under-estimated. It may well be greater than the value wildlife had during the earlier years of exploitation.

It is worth considering the economic and social consequences of nationwide decline in mammal and fish populations to a level that would deprive Canadians of the pleasures of hunting and fishing.

Sporting goods stores and manufacturers would suffer immediately and directly, and many other businesses would feel the effect in some degree. Producers and retailers of boats, camping gear and specialized outdoor clothing, the transportation industry, hunting camps and resorts—all these and many more that provide supporting services for hunting and fishing would lose a major market. Agriculture, forest industries and employment generally would not escape the consequences.

Even more substantial would be the emotional, psychological and social effects. Canadians would be deprived of a recreation activity that is both a sport and a hobby. For many people, a weekend of fishing at a favorite lake, a week of deer hunting, or a few early morning hours of duck hunting sometimes taken before a busy working day, is the most prized of all recreation activities. In hunting and fishing they find satisfaction that is becoming increasingly difficult to find in modern life, and re-live in the gunshots and the bending rod the atavistic experience of conquering nature. With the increasing tensions and pressures of life in the modern world, the value of recreation is being accorded a steadily higher place. Probably the most generally enjoyed of recreations are associated with wildlife in its various forms.

Tangible evidence of the economic and recreational importance of hunting and fishing in the United States was provided by a survey carried out in 1955 on behalf of the Fish and Wildlife Service of the U.S. Department of the Interior. No comparable survey has been made in Canada but it is fairly safe to assume that Canadian recreational habits are similar to those revealed in the survey. The results also have a Canadian application in the hundreds of thousands of U.S. tourists who travel north each year, primarily for the great hunting and fishing opportunities Canada offers.

The U.S. survey produced some remarkable information. One out of every three households had one or more fishermen and hunters; one man of every five hunted. In 1955, U.S. hunters and fishermen spent almost \$3 billion and travelled 10 billion miles on their sports.

About five million hunters travelled from one to 250 miles for hunting but half this number travelled more than 750 miles. Of this latter group of about 2.5 million, 1.8 million travelled more than 1,000 miles for the hunting they wanted. The results of the poll among fishermen are even more striking in their economic implications to Canada; 5,453,000 people—almost a quarter of the total number of fishermen—travelled more than 1,000 miles to fish.

Canada's wildlife resources support an annual expenditure on hunting and fishing of possibly \$300 million. Their economic value in relation to other recreations such as photography, nature study and casual sight-seeing is difficult to estimate. For thousands of people it is a rare privilege to observe a wild animal or bird in its natural surroundings and preserve that memory on film. Interest in wildlife for its beauty and grace and novelty alone is growing and is a factor that cannot be dismissed in any assessment of wildlife's value to our economy.

While recreation appears to be the major use for wildlife many Canadians still rely directly on game for their livelihood and even for their existence. Fur-trapping is still an important occupation in Canada. In 1958-59 Canadian wild fur sales totalled more than \$9.7 million. Many Eskimos and Indians earn their livelihood from fur-trapping and they need wildlife for food and clothing. Much of the economic and social difficulty that has been experienced by some groups of Eskimos stems directly from a decline in the



number of caribou, which had provided meat for food, hides for warm clothing, and bone for implements.

Wildlife also controls insects and small mammals which damage crops. The coyote preys on the field mouse and the extent of his control is only being properly appreciated now that he has been killed off in western agricultural areas by an extensive poisoning program. Birds feed on a great many insects that harm agricultural production and damage and kill commercial timber stands and shade trees.

The main objective of Canadians concerned with the future of wildlife is that it should be managed properly as a renewable natural resource of great value. As a natural resource it should not be regarded as a competitor of other resources for our attention, but as an integral part of the whole complex of natural resources that are of value and benefit to man. The relationship between resources is a difficult subject to understand and man's attempts to put comparative artificial valuations on resources have complicated the subject further. Wildlife as a resource will be given attention at the forthcoming "Resources for Tomorrow" Conference. This conference, which will be devoted to a study of renewable resources and their use by Canadians, should encourage a clearer understanding of the position wildlife occupies in our national life.

Wildlife management in Canada must place stress on the preservation of natural habitat as much as it stresses the preservation of the mammals and fish which live there. A wild animal and its surroundings cannot be separated; one cannot be preserved without preserving the other.

Management must also solve the problems arising, ironically, from under-use of wildlife. The scientific training and practical experience of the wildlife biologist may enable him to effect increases in wildlife population, but as yet he has only a very limited knowledge of rational and acceptable methods of influencing men to harvest a surplus wildlife crop. As in many other fields, technology has surpassed man's progress in managing his own affairs, and created disturbing new problems. The early conservationists would indeed be disillusioned to discover that the modern wildlife scientist is as often concerned with a surplus of some species of mammal as he is with the preservation of a rare species threatened with extinction.

The dynamism of wildlife is often not appreciated. The creatures of the wild concentrate their energy on reproduction and the care and upbringing of their young. This is a tremendous force, causing many species to multiply so rapidly that the problem may easily become one of over-population and control instead of protection. Changes in habitat intensify this effect. The replacement of evergreen by deciduous forests in British Columbia benefited moose and, with plentiful food, they multiplied until their population exceeded the land's capacity to support them. Similarly beaver flourish when deciduous forests are present and decline when the evergreens become dominant.

With protection and suitable habitat, the beaver, for example, more than recovered from over-trapping and is present in numbers probably greater than at the height of the fur trade. About 1930 Grey Owl, the great friend of the beaver, started a colony in Prince Albert National Park with two beavers, Jelly Roll and Rawhide; to-day the park, which was almost empty of beaver in 1930, contains many thousands of the hard-working creatures—a population too large to be treated with indifference by park officers. Even in densely populated urban areas beavers flourish. Within a short drive of Ottawa there are so many beaver that several farmers make a respectable part-time income from trapping them for their pelts.

This ability of wildlife to recover quickly from losses and exploitation brings other problems to wildlife officers besides those of over-population. Because most wild species are not easily seen, they can multiply rapidly before their increase is detected. This necessitates careful and frequent inventories. Unlike other resources, an estimate of quantity does not last long. Inventories must be repeated frequently lest significant population changes pass unnoted.

Research is of course basic to any improvements in wildlife management. One relatively neglected area is the pathology and diseases of wildlife. Another is the effect of chemical control agents such as insecticides. U.S. Fish and Wildlife investigators have found that quail are unable to reproduce adequately when insecticides have been introduced in their environment; insecticides may have a more destructive effect on game birds than they are already known to have on fish. The responsibility for increased research will be that of the wildlife biologists; this handful of scientific investigators and advisers will have to be strengthened and given more public backing if they are to provide the sound factual basis for improved wildlife management programs.

Canada's wildlife is far from a passing phenomenon, a resource that had only temporary value during earlier stages of economic and social progress. In contemporary life the creatures of air, field, forest and stream are a vital natural resource as worthy of being managed scientifically and administered wisely as of being preserved humanely. Conservation in the modern wildlife context is a combination of scientific research and practical management based on informed public support and co-operation. It calls for close teamwork between conservation officer, scientist, administrator and particularly the citizen, who has a responsible position on the conservation team.

Annual Report of the Department of Northern Affairs and National Resources

“Northern Affairs and National Resources” is the most recent of several names under which this department has operated almost since Confederation. It was then and is today a development department charged with encouraging growth and progress in the northern territories and by various forms of assistance, aiding orderly and sane use of national resources.

Eight branches form the Department.

The Northern Administration Branch bears heavy responsibilities for the economic and social development of the Yukon and Northwest Territories and for the welfare of the Eskimo people.

The National Parks Branch is the administrator of Canada's National Parks and National Historic Sites and Parks, conserving for future generations the richness of Canada's past and the wonders of its natural beauty. The Canadian Wildlife Service, forming part of this Branch, is the federal agency responsible for national wildlife conservation and research.

In the resources field are the Water Resources Branch and the Forestry Branch. The Water Resources Branch collects and evaluates basic information on Canada's water-power resources and studies broad questions of water use policy.

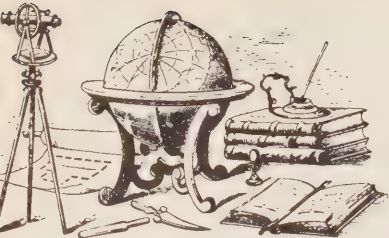
The Forestry Branch engages in forest and forest products research and administers various agreements with the provinces made under the Canada Forestry Act.

The Natural History and Human History Branches form the National Museum of Canada which is engaged in scientific research in natural history, archæology, and anthropology.

The Canadian Government Travel Bureau works in many ways to increase the tourist traffic, its major effort being the vigorous promotion of Canadian tourist attractions in the United States.

To serve these various operating Branches are the administrative divisions—Economic, Editorial and Information, Legal, Personnel, and Purchasing—which, under general direction from the Chief Administrative Officer, comprise Administration Services.

Certain Boards, Commissions, and Advisory Committees report to the Minister. These include the Historic Sites and Monuments Board of Canada, the National Battlefields Commission and the Advisory Committees on Northern Development and on Water Use Policy. The Secretariat of the Resources for Tomorrow Conference reports to a Federal-Provincial Committee of which the Minister is Chairman.



Northern Administration Branch

The Northern Administration Branch is concerned with the administration of the Northwest Territories and the Yukon. It is responsible for all Eskimo affairs, whether in the territories or in the provinces, and for the resources of both territories together with certain Crown lands and mineral rights which are the responsibility of the Government of Canada in the provinces.

Territorial Governments with powers roughly analogous to those of the Provincial Governments have been established for both territories. In the Yukon, there is a Territorial Civil Service which administers all Territorial matters from Whitehorse, but in the Northwest Territories, where the only Territorial Service is the liquor system, the Branch provides the administrative machinery for the Territorial Government. In addition, the Branch also exercises a supervisory function, on behalf of the Federal Government, over the administration of all territorial affairs in both territories.

The responsibilities of the Branch are broken down among six line divisions, the offices of the Administrator of the Mackenzie, the Administrator of the Arctic and the Commissioner of the Yukon.

The Industrial Division handles such matters as industrial liaison, community and area planning, marketing research, cooperatives, a tourist office for the Government of the Northwest Territories and the encouragement and development of handicrafts, resource harvesting, and other activities designed to improve the economic well-being of the people of the north. The Welfare Division is responsible for welfare services in the Northwest Territories and for all Eskimos everywhere in Canada except Newfoundland.

The administration of mineral and other resources (except game) are dealt with through the Resources Division. Game in the Northwest Territories is the responsibility of the Territorial Division. In the Yukon, it is administered by the Territorial Civil Service. The Education Division operates the school system of the Northwest Territories except for the two school districts in Yellowknife.

The Engineering Division is responsible for all Branch construction and maintenance and the supervision of the financing of the Roads to Resources Program. The work of the Territorial Division is devoted almost entirely to the administration of the legislation of the Northwest Territories. However, it also carries out the supervisory functions of the Branch with respect to the Territorial Government of the Yukon.

During the year, the first phase of decentralizing the Branch's administrative functions in the Northwest Territories to the offices of the Administrator of the Arctic and the Administrator of the Mackenzie was completed. This is the first step in the transfer of all administrative detail to the field offices. When completed, the line divisions will be free to devote themselves to policy matters and the co-ordination of field administration.

The Office of the Administrator of the Mackenzie

This office provides field staff for the administration of federal responsibilities in the Mackenzie District and Banks and Victoria Islands of the Northwest Territories for natural resources, education, Wood Buffalo National Park, and welfare. It also provides administrative services for the territorial government, which has legislative responsibility for game, civil law, municipal districts and unorganized settlements and welfare (other than Indian and Eskimo).

The headquarters of the Mackenzie Administrator is at Fort Smith, N.W.T. and offices are at Inuvik, Aklavik, Yellowknife, Hay River, Coppermine, Tuktoyaktuk, and Cambridge Bay.

Education

Twenty-two schools were in operation in the District with a total enrolment of 3,371, made up of 534 Eskimo, 1,100 Indians, and 1,737 children of white status. Summer seasonal schools were in operation at Nahanni Butte, Trout Rock, and Snowdrift, N.W.T. Residences are operated to accommodate certain children attending day schools. These children come from homes lacking school facilities within reasonable travelling distance. The residences are located at Fort Smith, 250 beds; Fort McPherson, 100 beds; Inuvik, two residences of 250 beds each. In addition to the above for primary grades, a residence for 80 high school students is located at Yellowknife, N.W.T.

A milestone in the federal school system, established only a decade ago, was the opening in September, 1959, of a new 25-classroom school and two residences, at Inuvik, serving the Western Arctic.

Vocational and high school courses are offered at Sir John Franklin School, Yellowknife. Students are enrolled from settlements of Mackenzie District and the Eastern Arctic. Workshop and home-making courses were extended to some schools of the District. Special vocational projects included fur garment making and house construction. Some students have been sent to the provinces for vocational training which cannot at present be offered in the Northwest Territories.

Forests

Forest management and protection services were provided for selected timbered areas of Mackenzie District and Wood Buffalo National Park.

Production from the considerable stands in Wood Buffalo National Park increased slightly, with 17 million board feet produced in 1959, largely for southern markets.

A small, but locally important, production of 1½ million board feet was produced in Mackenzie District, involving operations along the Slave and Mackenzie Rivers in the Hay River, Fort Simpson, Port Radium, and Mackenzie Delta areas.

The protection work was relatively heavy, with 85 fires destroying a total of 111,344 acres. Total fire fighting costs were \$60,000 averaging \$636 per fire. Lightning strikes and long-smouldering winter camp-fires were the principal causes of these forest fires.

Minerals

The Mining Recorder's office, at Yellowknife, N.W.T., reported a rise in staking activity to a total of over 4,000 claims in 1959-60. The most promising find was tungsten, in apparently large volume and high grade, in the Flat River area (headwaters of the Nahanni) near the Yukon-British Columbia-Northwest Territories Boundary. Considerable activity throughout the Mackenzie basin in the search for oil had a marked effect on the general economy.

Production was chiefly gold from the Yellowknife area, and oil from Norman Wells.

Wood Buffalo National Park

This park comprising over 17,000 square miles, the largest of our national parks, was set aside for the preservation of the wood bison. Despite major intermingling with prairie bison it has now been established that some of the original wood bison still remain and steps are being taken towards preserving them.

Four hundred and thirty-six buffalo were slaughtered at Lake Claire abattoir and the meat, totalling over two hundred thousand pounds, was marketed in the Northwest Territories. This harvesting serves a double purpose in controlling the natural increase and partially controlling disease, since the killing was selective. Testing in 1959-60 indicated a reduction in the incidence of disease in the buffalo herds at Lake Claire.

Welfare

A small organization provided trained welfare workers for the areas about Fort Smith, Mackenzie Delta, and Cambridge Bay, N.W.T. Conditions are such that most welfare services must be directed to meet basic needs for food, shelter, and clothing. Much of the work is done by other agencies and individuals as circumstances permit.

Northern Service officers were maintained at Tuktoyaktuk, Coppermine, and Cambridge Bay, N.W.T., for the purpose of assisting the Eskimo people to adjust, in this period of a difficult trapping economy, to a beginning, and as yet inadequate, wage economy.

Engineering

Highway construction proceeded under contracts with an expenditure of \$5,140,000. This included approximately 100 miles in the portion Fort Providence (Mackenzie River) towards Yellowknife, N.W.T., and 25 miles from Fort Fitzgerald, Alta., to Bell Rock, N.W.T. (Slave River). Construction

of 50 miles of secondary roads, largely in Wood Buffalo National Park, was carried out in the Fort Smith area, using departmental equipment and day labour, with an expenditure of \$395,000.

Building construction and maintenance was by contract or day labour, depending on the size of the project and local conditions. Included were such major items as sewer and water systems at Fort Simpson and Fort Smith, completion of the large school and hostels at Inuvik, and the first of two years' construction of a school and hostel at Fort Simpson, N.W.T., together with many lesser projects throughout the District. Expenditures totalled \$5,027,000.

Game

Administration under the Territorial Game Ordinance was carried out by a force of seven game officers and nine patrolmen under the direction of a Superintendent of Game.

The barren-ground caribou, although still in critically small numbers, made a slight gain in 1959-60. Wolf control measures continued with apparently effective control on the caribou range.

Sport hunting was opened in the Northwest Territories for buffalo, which have migrated in numbers out of Wood Buffalo National Park. Twenty-nine buffalo, one per licence issued, were taken. It is expected that the scope of this hunting will expand to the benefit of local trappers employed as guides.

Trapping returns were generally good in forested areas, but poor in the barrens.

The Office of the Administrator of the Arctic

This office with headquarters in Ottawa is responsible for the administration of the provisional Districts of Keewatin and Franklin (except Victoria and Banks Islands) and for the administration of Eskimo affairs in northern Quebec. A regional headquarters is maintained at Churchill, Man., with area offices at Rankin Inlet and Baker Lake. Another regional headquarters is maintained at Frobisher Bay, with an area office at Cape Dorset. Northern Quebec area offices at Fort Chimo, Sugluk, and Great Whale River reported direct to the District Office. Area offices were under construction at Coral Harbour, Igloodik, and Pond Inlet in the Northwest Territories, and at Port Harrison in northern Quebec. In communities where no administrators were posted, community principals and teachers carried out administrative duties in addition to their educational work. The development of district, regional, and area headquarters led to greater co-ordination of the Department's various programs in the field.

Economy of the District

While permanent wage employment in the District continues to increase, notably at such centres as Churchill, Frobisher Bay, and Rankin Inlet, some diversification of the economy of those still living on the land continues to be

needed, particularly in parts of Keewatin and northern Quebec. For those dependent on hunting and trapping, some relief was afforded by the fact that the price for white fox fur was the highest in more than 20 years. Unfortunately the harvest was good only in parts of northern Quebec, with catches being insignificant in Keewatin and Franklin.

Some Eskimos found seasonal employment with mining exploration companies, government survey parties, and stevedoring companies. The best hope for improvement in some areas, however, lay in the activities of field officers who, in co-operation with specialist officers of the Industrial Division, carried out commercial fisheries and logging in the George River-Port Burwell area in northern Quebec, a commercial fishery at Frobisher Bay, and a tourist operation at Cape Dorset. Fisheries for domestic use were carried on by field officers at Baker Lake, Rankin Inlet, and other points. An expansion of this kind of activity is indicated for 1960 in those areas where wage employment is not yet a significant factor.

Engineering Services

With construction crews working out of Churchill, Fort Chimo, Frobisher Bay, and Great Whale River, under the direction of the Arctic District Engineer, work was carried on in 24 communities in the District. The following buildings were completed: 1 six-bedroom children's home, 46 houses, 22 apartments, 11 schools, 9 powerhouse-warehouses, and 3 miscellaneous buildings. The following buildings were partially completed: 3 houses, 1 school, 3 powerhouse-warehouses, 2 garages, 1 transit centre, and 1 workshop. In addition to the foregoing, 17 units of living accommodation for Eskimos employed on the DEW Line were erected. The first full year of the program of providing low-cost houses for other Eskimos saw 120 units shipped and 82 erected. This latter work was carried on in co-operation with, and frequently under the supervision of resident field officers, with as much of the construction as possible being done by the prospective Eskimo purchasers.

Education

Under the direction of the Chief Superintendent of Schools for the Arctic District, there were 43 federal classrooms in operation educating 871 Eskimo children (40 per cent of the school-age population), 25 Indians and 51 others, located in 17 schools. In addition, there were 11 part-time mission schools receiving grants-in-aid based on minimum attendance. One seasonal school operated during the summer months. There were 43 teachers, one teacher's aid and two vocational training instructors employed in the District. In order to have more Eskimo children attend school on a regular basis, eight new schools with 17 classrooms were being erected for opening in September, 1960, and six small hostels were planned for Baker Lake, Port Harrison, and Great Whale River.

Adult education has been the concern of teaching staffs in most communities in the District and a good beginning has been made in home-making, child care, and Basic English classes.

In co-operation with teachers and administrators in the field, the District Education Office selected candidates for courses arranged by the Vocational Training Section of the Education Division. On one particular course, held at the RCME School, Barriefield, Ontario, some 20 Eskimos with little or no formal education received training in the operation and maintenance of diesel electric power plants and most of the graduates are now in full-time wage employment.

Orientation courses were held in Ottawa in August, 1959, for new teachers. In January, 1960, teachers of the Churchill Region met for a week's conference at Churchill.

Welfare

The Eskimo Rehabilitation Centre at Frobisher Bay continued to provide rehabilitation services for persons discharged from tuberculosis sanatoria and for other disabled Eskimos. Such projects as a laundry, bakery, movie house, sewing centre, and barber shop provided re-training opportunities for disabled people. At Churchill, Man., three children's receiving homes and a home for aged people were operated.

Welfare activities were considerably hampered by the shortage of trained welfare officers in the field. The year began with two social workers in the District and ended with one. Nevertheless, in co-operation with other members of the field staff, good work was done in the provision of social assistance, in the placement of children in foster homes, in the maintenance of contact between patients in sanatoria in Southern Canada and their families in the North, and in many other related activities.

General

Officers of the Arctic District arranged the Tenth Annual Meeting of the Eskimo Affairs Committee in Ottawa on May 25, 1959. This meeting was distinguished by the attendance for the first time of four Eskimo delegates.

A training course, the "Northern University", was organized for new northern service officers, social workers, teachers and other field staff to enable them to carry on their work more effectively. Participation in the annual Eastern Arctic Patrol on the C.M.S. *C. D. Howe* took place during the summer months and a number of air patrols were made to many communities in the District by district, regional, and area officers.

Representatives of the District took part in proceedings of the Interdepartmental Meteorological Committee, the Interdepartmental Committee on Fur Promotion, the Canadian Board on Geographical Names, and many other committees.

Education Division¹

The education of children in the Northwest Territories is the joint responsibility of the Federal and Northwest Territories Governments. The Federal Government is responsible for the education of Indians and Eskimos; the Territorial Government is responsible for the education of other children. Territorial funds reimburse the Federal Treasury for the expenses of educating non-native children.

The average school attendance of non-native children is much higher than that of Eskimo and Indians. Most non-native children have parents who earn a more or less steady income and have a permanent home in a community with a school, and the children are, therefore, able to attend school regularly. As a result, the regular attendance of all native children (both Indian and Eskimo) is approximately 70 per cent as compared to more than 90 per cent for all others.

The aim of the Department is to provide elementary education and advanced academic or vocational education for students and adults with special aptitudes. This program is being developed by the construction of new government schools and students' residences, by providing more bursaries and other aids for students, by development of special curricula for northern schools and by conducting special vocational educational projects.

The Department has 39 schools, 33 of these in the Northwest Territories, five in Northern Quebec and one in the Yukon Territory. There were nine part-time schools operated by Roman Catholic and Anglican missions and assisted by Federal Government grants. Federal schools which allow full-time attendance are replacing these. One mission residential and day school was operated and in addition there are three company schools and two municipal schools. The increase in the number of federal day school rooms since 1950 is illustrated by the graph on Page 31.

Total attendance at federal schools in the Northwest Territories was 3,337. Of this total, 1,186 were Eskimo pupils, 928 Indian, and 1,223 white.

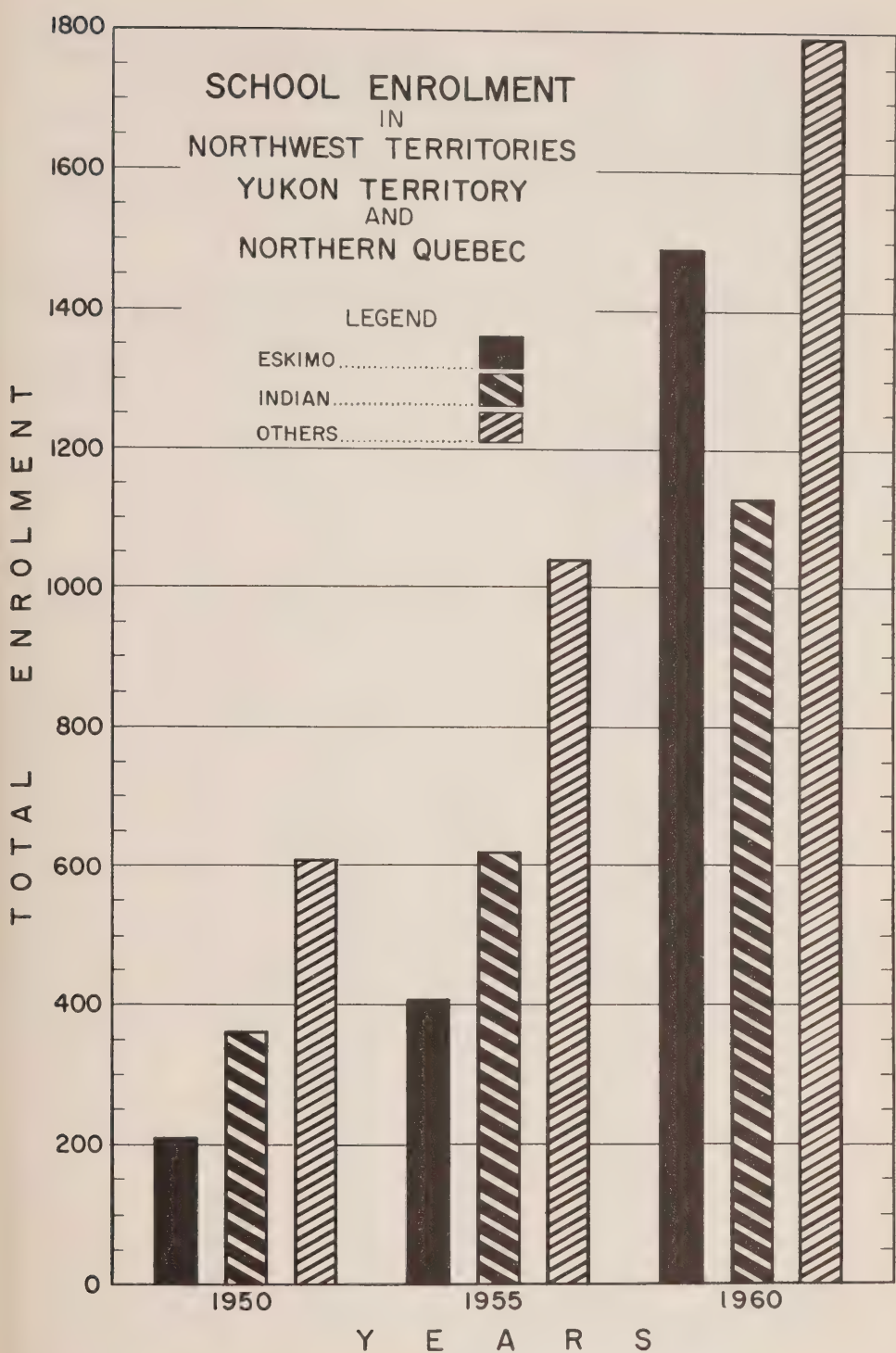
Vocational Education

Industrial Arts and Home Economics

These courses are offered at Grades 7, 8, and 9 with more advanced courses for Grades 10, 11, and 12.

A new centre was opened at Inuvik. Two Home Economics teachers were employed. The Industrial Arts teacher is preparing boys for vocational courses at Yellowknife. Evening and part-time classes are provided for adults.

¹ See Appendix B, Nos. 4, 5.



Industrial Arts training has not yet started at Frobisher Bay but Home Economics is progressing satisfactorily. A carpentry instructor will offer training in wood working until more space is available in September, 1960.

A limited program was carried out at Great Whale River.

In areas with limited enrolments, part-time instructors are hired locally.

Vocational Training at N.W.T. Centres

At the Sir John Franklin School, Yellowknife, the program was based on carpentry and building construction, and mechanics. A technical elective course in Industrial Arts and Home Economics was offered Grades 10, 11, and 12. A heavy equipment operators' course was introduced for students from both the Eastern and Western Arctic. A power station for the Northern Canada Power Commission was utilized as a live project for carpentry and building construction classes.

Vocational Training at "Outside" Schools

When facilities are not available in the Northwest Territories students are sent to schools in southern Canada. Such training included business training, nurses' aides, teacher training, and academic up-grading.

Special Projects—Northwest Territories and Southern Canada

Diesel power plant operators in co-operation with the R.C.E.M.E. Training School at Barriefield, Ontario.

Portable saw-mill and log home building for Indians in co-operation with Indian Affairs Branch.

Fur garment manufacturing at Aklavik. Small factory and production line techniques were used.

Junior forest rangers course to encourage youths to engage in forestry and game preservation work. A tent camp in Wood Buffalo National Park was set up and useful work was performed as a part of the training.

A caretaker course at the Sir John Franklin School to improve the work of school janitors.

A pre-fabricated boat building program at the Sir John Franklin School for the Eskimos at Contwoyto Lake. Parts were shipped for completion on site.

On-the-Job Training

Many persons were placed in a variety of trades where they could learn useful skills while working. During the training period, the Department subsidizes wages by an agreement with the employer. Categories of work included oil well drilling, equipment operators, mechanical maintenance, domestic training, and carpentry.

NUMBER OF
FEDERAL DAY SCHOOL ROOMS
IN
NORTHWEST TERRITORIES
YUKON TERRITORY
AND
NORTHERN QUEBEC

FEDERAL DAY SCHOOL ROOMS

225
200
175
150
125
100
75
50
25
0

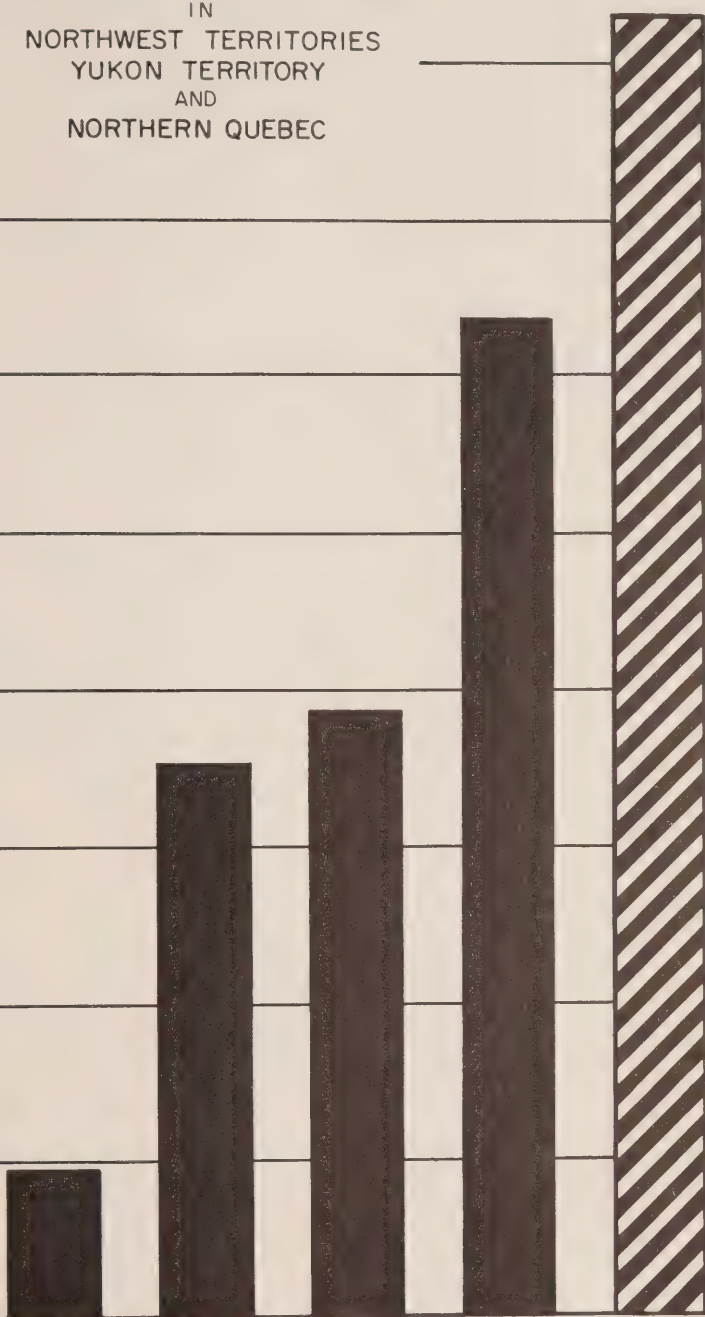
1953

1957

1958

1959

1960-61



Engineering Division

The past year saw the Division's Ottawa staff increased by a number of architects, professional engineers, and other technical personnel to enable it to perform its enlarged responsibilities for the design, construction and maintenance of roads, buildings and engineering works in northern Canada. It also saw the establishment of a policy by the Treasury Board outlining the division of responsibility for construction work. In general the Northern Administration Branch will be responsible for its own projects up to \$250,000 in value, larger projects being passed to the Department of Public Works for execution.

Mackenzie District, N.W.T.

Work on the extension of the Mackenzie Highway from Enterprise to Yellowknife was continued during the year with an expenditure of about \$3.6 million. This project is scheduled for completion in 1960.

The reconstruction of the Fitzgerald-Bell Rock Road was completed at a cost of \$870,000. This road facilitates the portage of river-borne cargo around the Slave River Rapids.

Road construction in Wood Buffalo Park was continued, the major item being the road from Peace Point to the West Boundary which will eventually link up with a provincial road from High Level, Alta.

Construction of buildings in this District amounted to \$5 million. Major works were the completion of the school and hostel program at Inuvik and the continuation of the school and hostel at Fort Simpson. Water and sewerage systems were constructed at Fort Smith and Fort Simpson and a water supply and treatment plant was commenced at Hay River. Other construction included departmental housing units, small schools, warehouses, and various other structures.

Districts of Keewatin and Franklin, N.W.T., Northern Quebec and Churchill

Construction in these areas, consisting almost entirely of buildings, led to an expenditure of \$3 million.

Major programs were carried out at Frobisher Bay, Igloolik, Cambridge Bay, Churchill, and Great Whale River. Several housing units were erected at DEW Line sites for occupation by Eskimo employees of the Federal Electric Corporation.

Materials for small rigid frame houses, to provide a better substitute for the igloo, were shipped into several areas for sale to the Eskimos.

The Roman Catholic hostel at Chesterfield Inlet was purchased from the Mission and will be used as a departmental hostel.

Improved techniques and designs for housing units, schools, warehouses and other structures led to lowered unit costs, the major advance being in the adoption of a prefabricated stressed skin panel unit.

Yukon Territory

Expenditure on roads amounted to \$4.2 million. Major projects were the construction of the first 30 miles of the Flat Creek-Eagle Plain Road; the construction of three steel highway bridges over the Yukon, Stewart, and Pelly Rivers on the Whitehorse-Keno Highway, the first of which was completed during the year; the reconstruction of other development roads, and the survey of the proposed development road from Watson Lake to Ross River.

Expenditure on buildings amounted to about \$130,000.

Arrangements were made for the Yukon Territorial Government to carry out branch engineering projects in the Yukon.

Roads to Resources

Agreements with all provinces under the Roads to Resources program were signed and the administration of the program became the responsibility of the Division. A total of \$9 million was paid to the provinces for work performed under the agreements. The maps on Pages 34-35 show the agreed routes.

Industrial Division

The Industrial Division is responsible for the stimulation of the economic growth of the Territories. It is also responsible for some aspects of resource development and the planning of townsites and community services to meet the population and industrial expansion which is appearing in several areas. Emphasis is given to the development of the economic well being of the Eskimo peoples and to their full participation in the economic growth of the country.

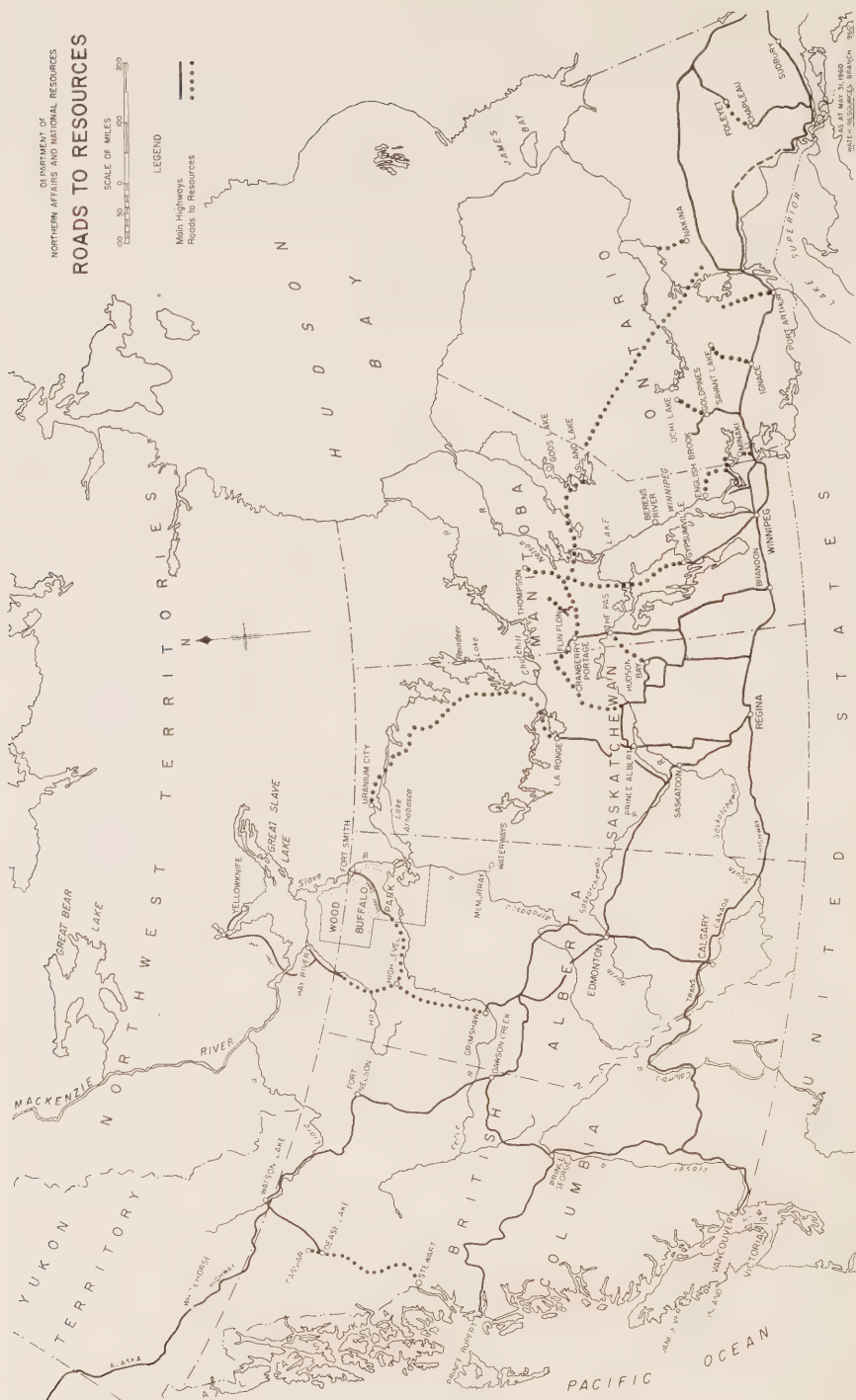
Projects

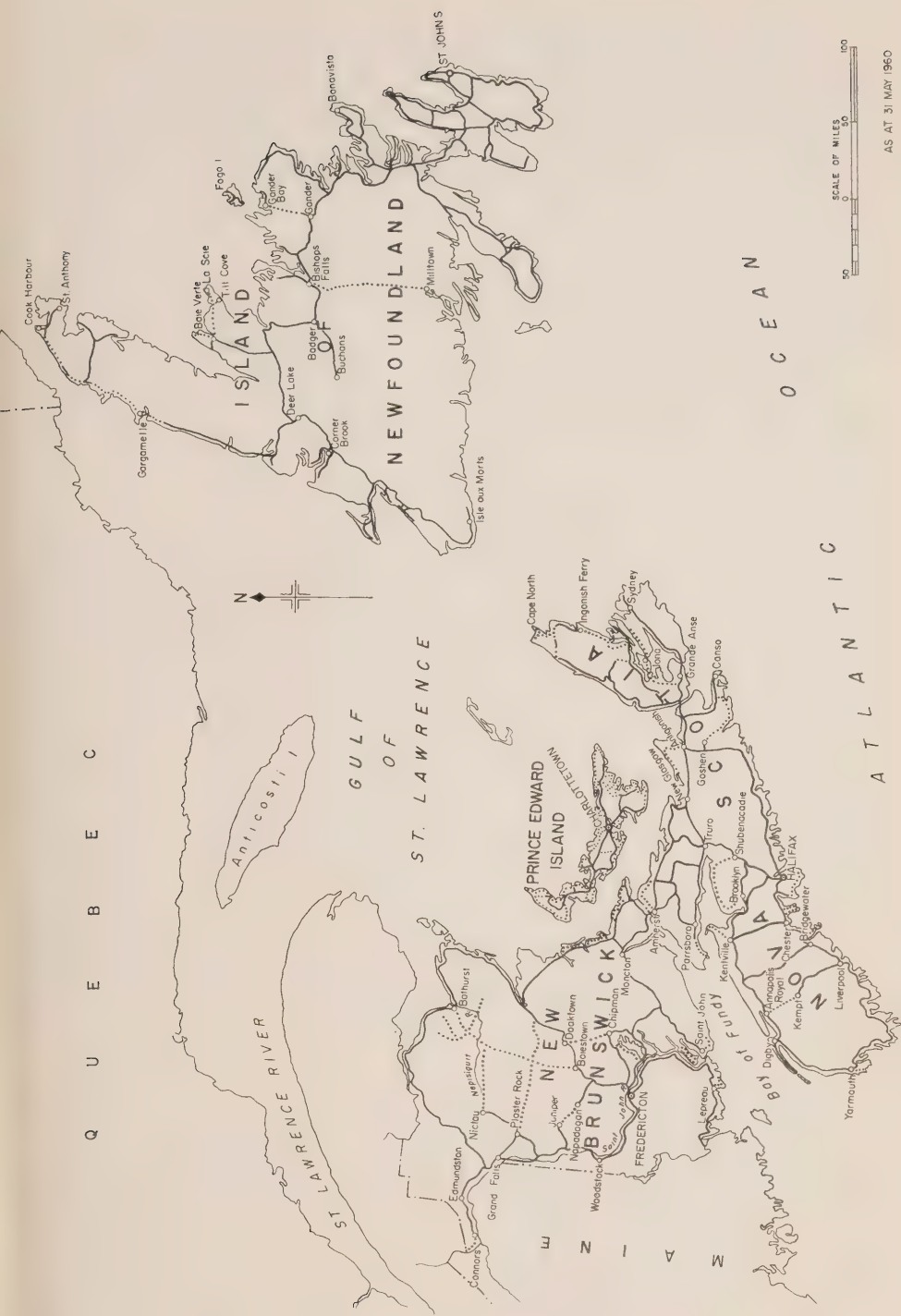
A program to rebuild the local economy in east Ungava Bay by the introduction of commercial fishing and self-help projects such as logging was undertaken last year. An Arctic char fishery at George River produced almost 19,000 pounds for sale on southern markets. Sufficient logs were rafted down the George River to construct a community hall on the George River for the beginning of a small community. A freezing plant was erected at Port Burwell to be used in a commercial char fishery in 1960.

A char fishery, similar to the one at the George River, was operated at Frobisher Bay, Baffin Island.

Field experiments in the use of Arctic marine resources were continued and further research was undertaken to assess their potential for both domestic and commercial harvesting. This was carried out in co-operation with the Department of Fisheries, the Royal Canadian Mounted Police and the Fisheries Research Board.

Construction was started in Newfoundland on two general purpose boats 40 feet in length, for use in resource harvesting in Ungava Bay and on the west coast of Hudson Bay.





AS AT 31 MAY 1960

Efforts were continued to stimulate the production of cottage industries by providing patterns, some basic materials, and instructions on production methods best suited to the demands of the southern market.

Considerable success has been achieved in experiments to find synthetic fabrics to replace animal skins for native clothing. Duplan and nylon pile, which can be produced at comparatively low cost, were found very satisfactory when tested by the Institute of Aviation Medicine, RCAF, Toronto.

The Department continued its administration of the reindeer industry which was initiated in 1935 on the Mackenzie Delta as a project to provide the Eskimo with employment and a local meat supply. At present there is one Eskimo-managed herd numbering about 1,900 animals. The remaining reindeer, approximately 4,100 animals, are in a main Government herd.

A project to ascertain the suitability of yak for herding by the Eskimos was continued. The nucleus herd is still under study in the Ottawa area preparatory to their placement in the north.

Co-operative Associations

Following the approval of the Ordinance for Co-operative Association in the Territories, a Co-operative Development Section was formed and two officers recruited to guide Eskimos in the setting up of co-operatives. Three Eskimo co-operatives were set up in 1959. Two were established in Ungava Bay to undertake commercial char fishing and the production of handicrafts at Port Burwell and the George River. A small co-operative retail store was established at Port Burwell. At Cape Dorset, the Eskimo Co-operative operated a tourist camp and engaged in the production of Eskimo graphic art. The tourist camp showed a net profit in its first year of operation, while the sale of graphic art resulted in a return of nearly \$20,000 to Cape Dorset.

It is now apparent that most of the co-operative associations in the north will be primarily of the producer type which will perform or finance a number of commercial activities with the purpose of increasing the income of the community. The Industrial Division gives considerable assistance in marketing the products from the co-operatives which it is hoped will both increase the standard of living of the Eskimos and will give them an opportunity to control their own economic affairs, and to understand in some measure the complexities of our industrial society.

Industrial Promotion

Markets for the sale of Arctic char, Eskimo handicrafts, and clothing were developed in many cities both in Canada and in the United States. The largest single marketing project was the sale of Eskimo graphic art produced at Cape Dorset. A formal showing of these prints was arranged at the Museum of Fine Arts in Montreal which resulted in the rapid sale of all available prints to leading museums and art shops in North America. All returns from this sale went to the West Baffin Eskimo Co-operative. Another showing and sale of graphic art will be held in February or March, 1961.

Arctic char are now on the menus of hotels, restaurants and clubs in such cities as Montreal and New York, Toronto and Chicago. This delicacy is also served aboard certain luxury airline flights. Promotional work to create market demand for char was carried out by the Division.

An industrial designer was added to the staff, and considerable progress was made in stimulating interest in the above products through the usual advertising media and by increasing the attractiveness of the articles being sold.

To meet the growing tourist traffic in the Northwest Territories, the assignment of a Tourist Development Officer provided the first organized "tourist bureau" for the Northwest Territories. This office will carry responsibilities similar to those of the provincial tourist bureaus in assessing the tourist potential of the N.W.T. and in promoting the development of tourist facilities and tourist traffic. A N.W.T. Tourist Association was formed in January, 1960, with delegates from the N.W.T., the provinces, and abroad. It will actively promote the tourist industry and advise the interested government agencies and any potential investors in the industry.

The first sport-hunting season for buffalo since 1886 was held in the autumn of 1959 in the Fort Smith area. One outfitter and 29 hunters from Canada and the United States were licensed and the season proved so successful that the 1960 quota for hunters has been increased from 30 to 100. Two outfitters are expected to be in operation during the coming year.

Two outfitters' camps were established in the Eastern Arctic on Baffin Island for fishing. Seal hunting was permitted at the West Baffin Eskimo Co-operative camp and proved very popular. Under terms of the licence, all seal meat was given to the local Eskimos for their use.

Several tourist and fishing camp outfitters operated in the Mackenzie District and offered a variety of facilities. Highway facilities to Great Slave Lake have greatly increased the attractiveness of this area for tourism, and there was a considerable increase in the number of travellers in the Mackenzie Valley last year.

Area Economic Surveys and Community Planning

The Division continued its series of area economic surveys initiated in 1958 and designed to remedy the economic distress of specified northern areas. In 1959 an economic survey was made of the Mackenzie Delta region, where standards of living, housing and morale of the people are exceedingly low. As a result, a program of improved resource harvesting will be starting during 1960 leading to a more effective use of fish and sea mammals, the production of locally produced dog-food, a logging program for housing, and the development of handicrafts and fur garments for commercial sale in the south.

A Community Planning Group comprising representatives of the Industrial, Engineering, Welfare, and Territorial Divisions was formed to plan the development of certain northern communities.

The Division continued its job of compiling research information on population, resources, and employment opportunities for each locality within the Northwest Territories; in carrying out liaison with other government departments and private groups interested in expanding northern communities and developing new industries there; and advising on such matters as local housing policy, the provision of local services, planning new communities and re-developing existing ones.

Frobisher Development Group

The Frobisher Development Group maintained active co-ordination of all activities at Frobisher Bay, and the Regional Administrator acted as local co-ordinator for the Department. Since February, 1959, when Frobisher Bay was declared a Development Area, the control of business and construction in the community has been facilitated. Commercial interest has continued to increase in response to growing population and there has been extensive construction activity in the area. Local and long-distance commercial telephone facilities were established. Tourist interest was spurred by the operation of a sport-fishing camp last summer twenty miles outside Frobisher Bay.

Construction of a refuelling base and its combined living and operations buildings for the Strategic Air Command, U.S.A.A.F., begun in mid-summer, 1958, and the extension of the airport runway to accommodate jet aircraft throughout the year, brought a large number of workers to Frobisher Bay. The two projects are scheduled for completion during the autumn of 1960.

The Department constructed additional temporary dwellings for its staff in the vicinity of the airport, which has become its principal housing and administrative centre. It is anticipated that all future departmental expansion will be in this area and that Apex Hill will continue largely as an Eskimo Rehabilitation Centre.

A team of design consultants, engaged in 1959 by the Department of Public Works, has been developing a plan for the permanent town for which a townsite about half a mile to the northeast of the airport was selected in 1958. This team, comprising five Canadian engineering and architectural firms, assisted by a town planner, established an office in Ottawa for this project and is to submit its report on the plan and an estimate of the cost of construction in the summer of 1960.

Resources Division¹

The Division administers the Crown-owned mineral rights, the forests and lands in the Yukon and Northwest Territories, and certain under-rights and surface rights vested in the Crown on lands in the provinces. It also assumes responsibility for making general recommendations on the development of all natural resources in the North, including recommendations on

¹ See Appendix B, Nos. 1, 2, 3.

the most desirable location of roads, railways, and airfields for resource development, and recommendations on land use in the North.

Crown land disposition policies were under review and a series of meetings with the Department of Justice to discuss major revisions of the Territorial Land Regulations were begun in 1959-60.

Following meetings with representatives of the Canadian Petroleum Association, the Canada Oil and Gas Regulations, replacing the Territorial Oil and Gas Regulations, were submitted to the Government for approval in 1959-60. (They were promulgated at the beginning of 1960-61.) One requirement of these regulations was that exploring companies must give proof of Canadian financial participation—or at least the opportunity for such participation—in their operations at the lease stage or beyond. With the passing of the new regulations, many applications for exploration permits in respect of acreage in the Arctic Islands were expected.

Study of northern mining policy was continued and meetings with the Department of Justice to discuss major revisions of the Territorial Quartz Mining Regulations and Placer Mining Regulations were held in 1959-60. Discussions with the mining industry on policy matters continued.

Once again the major activity in the development of northern Canada's mineral resources was in oil and gas. Over 15 million acres of oil and gas land permits were issued during the fiscal year. The most spectacular exploration was in the Eagle Plain region of northern Yukon Territory, an area which appeared to be very promising.

Oil and Gas—Northwest Territories and Yukon

Two public competitions were held for the acquisition of 37 grid areas and, as a result of these sales, 133 territorial oil and gas exploratory permits were issued.

A total of 207 territorial oil and gas exploratory permits covering an area of 10,089,932 acres in the Northwest Territories, and 120 permits covering 5,410,831 acres in the Yukon Territory were granted. Two oil and gas permits were converted into 10 oil and gas leases covering 57,328 acres in the Northwest Territories. The total acreage under exploratory permits, reservations and leases in the Yukon Territory and Northwest Territories on March 31, 1960, was 98,457,487. Applications for oil and gas exploratory permits covering 146,866,282 acres in the Arctic Islands were being held as of March 31, 1960, pending promulgation of the new Canada Oil and Gas Regulations.

Drilling activity increased in the Territories with 22 wells being drilled compared to nine during the 1958-59 season.

There has been much exploration activity during the past season, the most notable being in the Queen Elizabeth Islands, where geological parties were sent for the first time. In addition, six companies co-operated in a flying reconnaissance over the same group of islands.

Photo-geological examinations were made, in preparation for surface studies, by five companies on the Arctic Coast from the Yukon-Alaska boundary to the Liverpool Bay area, and some 150 miles inland.

Twelve companies were occupied with surface geological work in the Mackenzie River Delta area and four companies were working in the general area of Peel Plateau. Five companies had geological parties in the areas of Fort Liard and Nahanni.

A co-operative magnetometer survey over the Mackenzie Delta and Liverpool Bay was continued but because of poor flying conditions the survey has not been completed.

Two companies carried out gravity meter surveys, one in the Liverpool Bay area and one in the Fort Norman area.

A great deal of seismic work was carried out by 16 companies throughout the Territories.

Oil and Gas in the Provinces

One combined public competition was held for the acquisition of leases of oil and gas rights underlying one parcel of land in Manitoba, four parcels of land in Saskatchewan and fourteen parcels of land in Alberta. As a result of this competition, one lease was granted in Manitoba, three leases in Saskatchewan, and nine leases in Alberta. Royalty was received from eight wells in Manitoba, four wells in Saskatchewan, and five wells in Alberta.

Mining—Northwest Territories

A major exploration program undertaken by one company in the Wopmay River area, to the east of Great Bear Lake, sparked a rush which resulted in 2,500 claims being staked.

In the Foxe Lake area, 100 miles northeast of Yellowknife, 500 claims were staked covering a promising gold showing. The year's most important single event in the Northwest Territories was the announcement by the company performing development work in the Flat River area, close to the Northwest Territories-Yukon border, that over one million tons of tungsten ore carrying values of \$37 per ton had been outlined in their summer drilling program. During the winter, equipment and supplies were shipped into the area for use in the 1960 season.

The major gold producer in the Yellowknife area has overcome their metallurgical problem which has resulted in greatly increased recovery of gold. The other gold producers maintained production while one uranium producer was forced to cease operation because of exhaustion of ore reserves.

The nickel-copper mine on the west coast of Hudson Bay shipped concentrates having a value in excess of \$2,000,000.

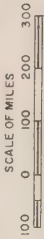
A total of 4,263 mineral claims were recorded.

Mining—Yukon Territory

In the three mining districts of the Yukon Territory there were a total of 586 quartz claims and 91 placer claims recorded.

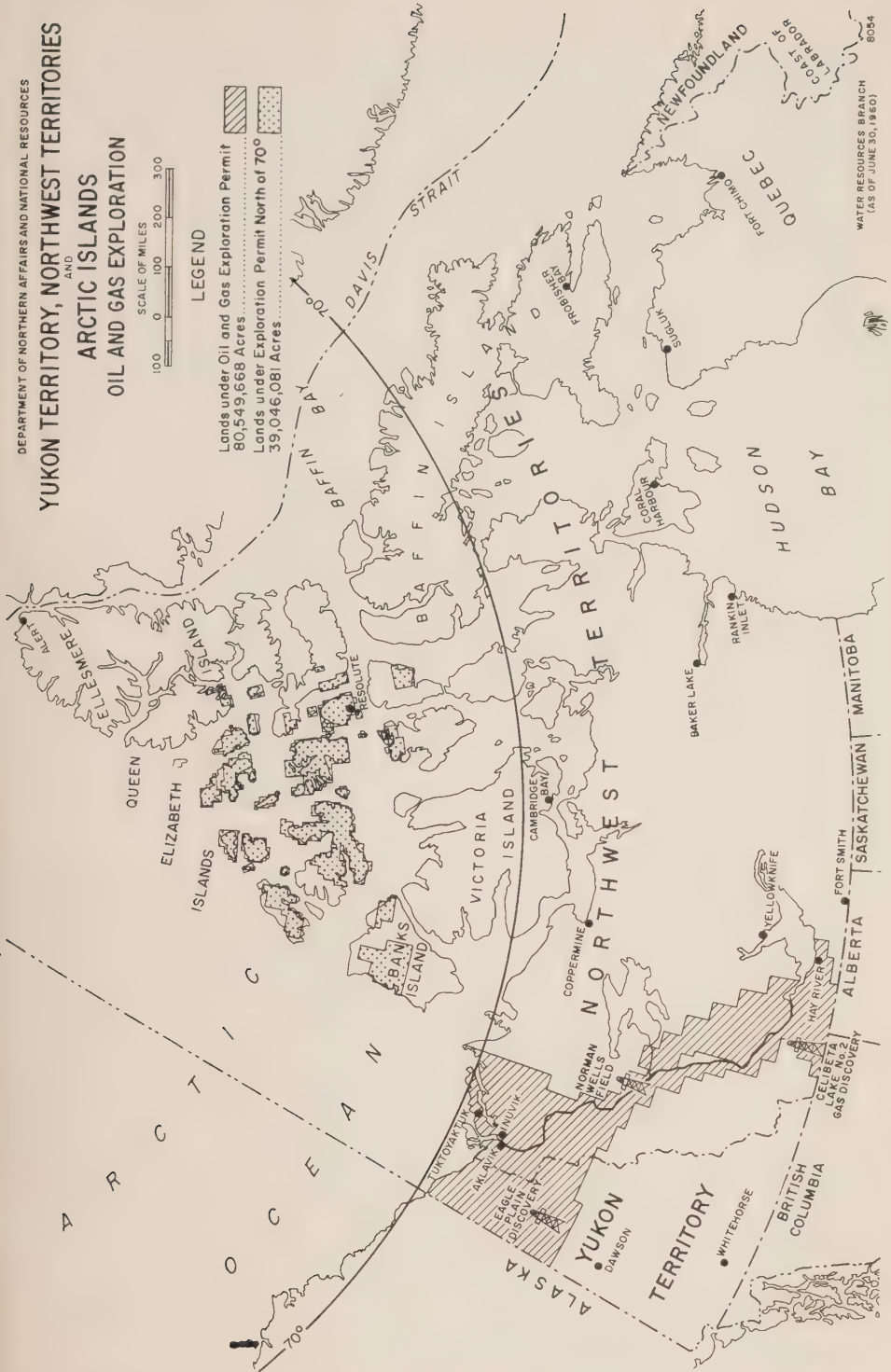
DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

YUKON TERRITORY, NORTHWEST TERRITORIES AND ARCTIC ISLANDS OIL AND GAS EXPLORATION



LEGEND

- Lands under Oil and Gas Exploration Permit
80,549,166 Acres
- Lands under Exploration Permit North of 70°
39,046,081 Acres



The areas of greatest activity were Dezadeash River, Carmacks, Quiet Lake, in the Whitehorse Mining District; Galena-Keno Hill, Davidson Mountain, and Rambler Hill in the Mayo Mining District; and Hunker Creek, Dominion Creek, Adams Gulch, Bonanza Creek, Sixty Mile River, and Cassiar Creek in the Dawson Mining District.

Considerable work was done in the Kathleen Lake area where 750 tons of bornite was shipped to Haines, Alaska, for trans-shipment to Japan. A major company has taken an option on this property and will be conducting an extensive program in 1960.

Production at the silver-lead-zinc mine at Galena Hill continued with emphasis being placed on those ores containing a good percentage of silver. During the year this mine became the major silver producer in Canada.

Gold production continued at the major placer operation in the Dawson Mining District.

Lands and Forests

Land disposal policies in Ontario, Manitoba, and Saskatchewan were studied with a view to developing a modern land disposal policy for both the Yukon Territory and the Northwest Territories. Basic principles of the proposed new policy have been drafted and submitted to interested parties inside and outside of the Government Service in the Territories for review. It is proposed to prevent waste by limiting the areas to a size reasonable for the purpose required and to match the type of land with the purpose for which it is to be used.

Several hundred inquiries relating to the availability of land in northern Canada were received.

Yukon Territory

There was a substantial increase in the number of land sales negotiated and leases issued. New areas suitable for vacation purposes have been opened up resulting in a number of new leases for summer cottage sites near Whitehorse. To provide additional sites, arrangements have been made to sub-divide a number of suitable lake-shore parcels. Attention is being given to increasing recreational facilities.

Residential type subdivisions were surveyed at Miles 912 and 921 (Porter Creek) of the Alaska Highway, providing a total of 305 lots within reasonable distance of Whitehorse. All lots in these subdivisions were transferred to the Government of the Yukon Territory for disposal. The survey of a subdivision on British Yukon Railway Company land has produced an additional 114 lots within the City of Whitehorse, and these lots will eventually be made available to the public.

The lands in the Yukon Territory for which letters patent were issued represent a total value of \$49,673.96 of which \$20,329.96 is accounted for in this report. The balance is the value of lots sold within the subdivisions transferred to the Government of the Yukon Territory.

The survey of a portion of the waterfront reserve immediately south of the Robert Campbell Bridge at Whitehorse, represents the initial step in the eventual conversion of this area to a public park.

Forty-two additional parcels of land in the Territory were reserved for the uses of the Governments of Canada and of the Yukon Territory.

Parcels of land purchased for the use of the Department, or otherwise acquired by the Division, numbered 12.

Fourteen permits were issued under which 170,305 cubic yards of sand and gravel and 430 cubic yards of rock were removed. Of this quantity, 138,412 cubic yards were utilized for road construction and repair, for which no royalties were paid.

The volume of lumber produced in the Yukon Territory increased approximately 85 per cent. The amount of round timber cut was almost equal to the figure for the preceding year, although the volume of fuelwood decreased by about 20 per cent owing probably to the increasing popularity of oil for heating purposes.

Northwest Territories

Continued interest in land in the Northwest Territories is indicated by the marked increase in the number of sales completed and leases issued for lands mostly in or near the settled areas. Additions to the settlements of Hay River and Yellowknife were surveyed, and it is expected that the construction of new roads will result in the establishment of some new settlements. Arrangements have been completed for the survey of one such subdivision at Franks Channel, where the road to Rae leaves the main Mackenzie Highway-Yellowknife Road.

It has not, in the past, been possible to describe accurately lands occupied for many years by certain trading posts in isolated areas of the Territories. With co-operation of the post operators, detailed sketches of the lands have been prepared, and the lands placed on a revenue-producing basis by the issue of leases.

A considerable portion of the Division's survey requirements involved Inuvik and Fort Smith; a number of subdivisions were made in both settlements and additional surveys are scheduled for the 1960 season. All lots in a large subdivision in Fort Smith were transferred to the Commissioner of the Northwest Territories for disposal.

At Pine Lake in Wood Buffalo National Park, a cottage site subdivision with excellent beach facilities has been made available, and it is expected that this will prove to be a popular summer resort. A number of new public camping and picnic grounds throughout the settled areas were set aside and additional sites will be provided as required.

An additional 61 parcels of land were set aside and reserved for Government use and 11 parcels purchased or otherwise acquired by the Division for the use of the Department.

Four sand and gravel permits were issued for the removal of 770 cubic yards of material.

The volume of lumber produced, although exceeding last year's figure by approximately 22 per cent, fell somewhat short of expectations. The total output of three large companies operating in Wood Buffalo National Park was 14,072,485 feet board measure.

Public Lands

Public Lands in the Provinces

These lands comprise former Ordnance and Admiralty Reserves, Public Lands previously administered by other Federal Government departments, and former Dominion Lands which were reserved from transfer to the Western Provinces and have reverted to departmental control when no longer required for the purposes for which they were originally set aside.

During the fiscal year, one parcel of land was placed under the administration of the Resources Division by the National Parks Branch, while two parcels were transferred to the Department of National Defence for military purposes. Seven sales were completed, four assignments were recorded, and 16 appraisals were carried out. There are now 24 agreements of sale and 85 leases in force, and over 1,500 parcels of land, in which this Department has a reversionary interest when they are no longer required by other Government agencies, have been listed. Eighty-two departmental properties were recorded with the Crown Land Registry, and 11 title searches were completed in order that the lands concerned be made available for lease or sale. Approximately 1,200 inquiries concerning general land tenure matters were answered, many of which were from non-Canadians interested in settling in this country.

Dominion Land Records

These records cover the administration of lands, timber, mining, and grazing rights in Western Canada, the Railway Belt and Peace River Block of British Columbia, between 1873 and 1930, when the natural resources were transferred to the provinces concerned.

During the past year 1,376 individual land settlement files were listed and shipped to the Provincial Archives. One hundred and twenty-eight certified true copies of letters patent were prepared on request, 12,718 patents were indexed according to land description, and over 140,000 land record cards were checked. Eleven historical research projects were completed, 17 title searches were carried out, and approximately 1,300 inquiries concerning land dispositions, mineral rights, and timber privileges were dealt with.

Seed Grain Indebtedness

Between 1876 and 1925 the Federal Government advanced seed grain, fodder for livestock, and other relief to needy settlers in Western Canada, and secured the advances by liens registered against their homesteads, pre-

emptions, and other lands. Advances for fodder and relief in the years 1919-1922 in Saskatchewan and Alberta were implemented on a joint 50-50 basis with the provincial governments under bilateral agreements.

In 1959-60 the Seed Grain Advisory Boards, which investigate outstanding accounts in Alberta and Saskatchewan, made recommendations relating to 116 accounts, and 532 liens were discharged. Principal and interest in the amount of \$72,002.51 was written off and \$15,855.77 was received in payments during the same period. As at the 1st of April, 1960, there were 471 Federal and 488 Joint Federal-Provincial accounts outstanding. Over 650 inquiries concerning seed grain indebtedness were received from the general public, legal firms, Farm Loan Boards, and the Provincial Governments.

Territorial Division

During the year the Division eliminated to a large extent any administrative functions and ceased to control field offices with the exception of the Superintendent of Liquor at Yellowknife and the Workmen's Compensation Office in Edmonton.

The Division continued to provide an advisory service to the Commissioner on such matters as game management, municipal affairs, labour legislation, health and vital statistics, taxation, professional and business licences, motor vehicle control and other matters relating to Territorial affairs. Certain of the ordinances have come under close scrutiny during the year and the Hospital Insurance Ordinance was introduced and given assent by the Commissioner. The Archæological Sites Ordinance was repealed. The following ordinances were amended: Fuel Oil Tax, Insurance, Liquor, Motor Vehicles, Workmen's Compensation, Hay River Municipal District and the Business Licence Ordinance. There were two meetings of the N.W.T. Council during the year, one at Chesterfield Inlet and one in Ottawa. A departure from usual practice this year will be the separate printing of the Commissioner's review and therefore no report from either Commissioner is included in this Annual Report.

Welfare Division

Direct relief in the amount of \$237,446 was issued to 330 Eskimo families during the year. Included in this amount are maintenance grants made to the families of Eskimo trainees attending vocational training courses.

An indirect type of assistance to Eskimo families was provided by participation in the low cost housing program. A proportion of the 125 plywood houses were assigned to the Welfare Division to provide shelter to needy families.

Another indirect form of relief was provided by a logging project carried on in the lower Mackenzie Valley in the latter part of the year. An

opportunity was afforded any able-bodied unemployed to cut logs of a suitable size along the Peel and lower Mackenzie Rivers. Ten cents per linear foot was paid for each log hauled to the river bank. Some of this timber will be used for building small dwellings for old age pensioners, some for fuel, and the rest for sawing into lumber. Projects of this type are a means of getting money for food, shelter and clothing into the hands of people in need as an alternative to relief.

In addition to the Homes for the Aged at Chesterfield Inlet and Pangnirtung, which are operated by the Roman Catholic and Anglican Churches respectively, the Branch has set up an Eskimo-operated home at Akudlik, the Department's village at Churchill. This facility is used to house those aged people who cannot conveniently be cared for at the church-operated homes. It has a present capacity of six.

The number of cottage-type Children's Receiving Homes at Churchill has been increased from one to three. These homes are used to care for very young children en route to and from hospitals in the south, as well as for children awaiting foster home placement. Similar facilities are planned for Fort Smith and Inuvik.

The Transit Centres at Frobisher Bay, Churchill, and Cambridge Bay accommodate the majority of the Eskimo patients moving to and from southern hospitals. The flow of traffic through these centres has been speeded up by the co-operative use of government aircraft based at Churchill and Frobisher Bay.

Rehabilitation Centres, based on the pilot project at Frobisher Bay, are being developed at Inuvik and Rankin Inlet. A superintendent, a workshop supervisor, and arts and crafts instructor form the nucleus of staff for the Inuvik Centre. At Rankin Inlet, the Keewatin Re-Establishment Project is being converted to a modified regional rehabilitation service. At the end of the year a superintendent had been appointed.

Social workers accompanied the 1959 Eastern Arctic Patrol on board C.M.S. *C. D. Howe* on its annual cruise of Arctic waters. Welfare services were provided for the families of patients evacuated to the south for medical reasons. In many cases this involved making arrangements for the care of children and the support of wives when the head of the family had to go out. The contacts made on these patrols are followed up by visits to the patients in hospital and by assisting them to keep in touch with their families.

A particular problem in the Mackenzie District has been the finding of suitable foster homes. Arrangements were made to increase the foster home per diem rate from a flat \$1.00 to \$1.55 for children under 13, \$1.65 for children 13 to 16, and \$2.00 for children 16 and over. Children requiring special care will be paid for at a maximum rate of \$2.30 per day.

The Eskimology Section carried out a number of special assignments in addition to its day to day work of translating Eskimo correspondence. Interpreting service was provided for the Eskimo delegates to the Eskimo Affairs Committee. A representative of the Section acted as "prisoner's

friend" on two occasions when Eskimo residents of northern Quebec fell foul of the law. Further editions of *Inuktitut*, the Eskimo language magazine, were published.

In the main, the efforts of the Welfare Division have been directed toward meeting the basic human needs of food, shelter, and clothing with the resources at its disposal. As these grow, so will its ability to provide welfare services comparable to those enjoyed by residents of the southern part of Canada.



National Parks Branch

Administration of the National Parks is carried on by four divisions: the National Parks Service, the National Historic Sites Division, the Engineering Services Division, and the Canadian Wildlife Service.

National Parks Service ¹

Early in the century, Charles Mulford Robinson, an American author who devoted his life to municipal aesthetics and town planning, wrote that "education gained from parks is that which makes for broader public sympathies and wider interests, for finer appreciation of the good things of life; it is that education which opens the public's eyes to the beauty that surrounds them, which makes us less of the animal and more of the man, richer through development of the resources within ourselves."

It is on this philosophy that the new public education program of the National Parks Service is based. This year a start was made on a long-range program aimed at developing a greater understanding in Canada of the real purposes and meaning of the national parks. Through many methods the national parks are being explained and interpreted as living museums of nature where people can observe and appreciate "the beauty that surrounds them".

An important development was the appointment of a regional supervisor with headquarters at Banff. The regional supervisor will be responsible for the co-ordination and implementation of national parks policy in all western parks; the standardization of highway maintenance programs; the co-ordination of fire protection measures and wildlife management proposals; the preparation of estimates, and generally assisting park superintendents with administrative problems.

An Education and Interpretation Section was established within the National Parks Branch and a Chief Parks Naturalist appointed to provide scientific advice on demonstrable natural history aspects of the national parks. Although the absence of other professional advisers prevented full development of the educational program, a great deal of work was carried out with the co-operation of all divisions of the National Parks Branch and other departmental agencies.

Nature trails were developed in Point Pelee, Banff, Fundy, and Cape Breton Highlands National Parks and printed guides to these trails made available for park visitors. Species of trees on the trails were identified, and information on the shrubs, wildflowers, wildlife and geological features was provided in the guides. Through field observation and the assistance of park wardens, information for six additional nature trails was assembled.

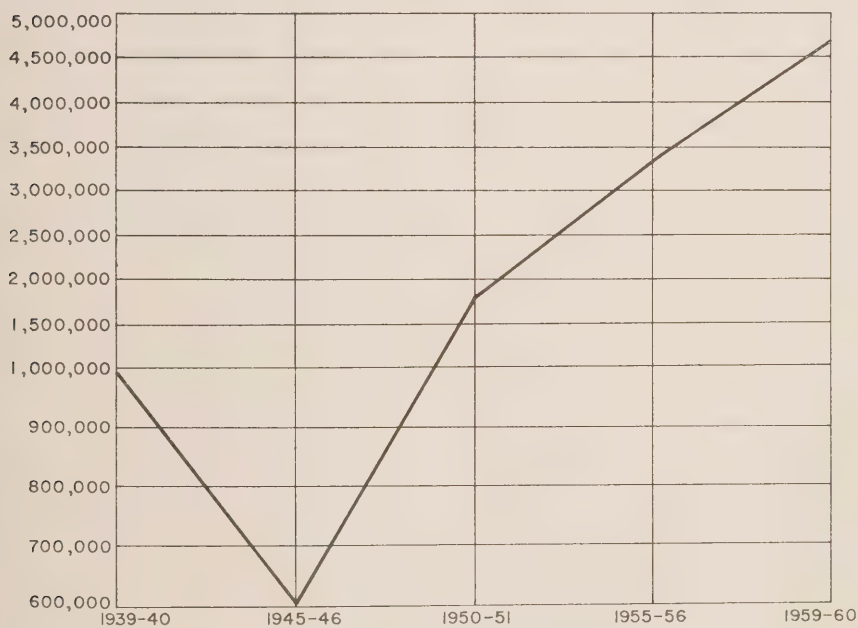
¹ See Appendix C, Nos. 1, 2, 3, 5, 6.

Other material published included the *Spring Birds of Point Pelee National Park* and *The Plants of the Woodland Nature Trail—Point Pelee National Park*. Also prepared for publication was *A Guide to Geology—for Visitors to Canada's National Parks*. This is a layman's guide to geology intended to supplement the detailed booklets which are being published by the Geological Survey of Canada on the geology of individual parks. Seven Geological Survey field parties assembled information on different park areas in the summer of 1959.

A major effort was made to prepare parks staff for participation in the education program. Talks were given at conferences of park superintendents and chief park wardens and at wardens' training schools.

Increased use of the parks was evident during the year when the total number of visitors reached a new high of 4,600,434, an increase of 313,091 over the fiscal year 1958-59. The largest increases in attendance were registered at Banff, Kootenay, Point Pelee, and Cape Breton Highlands National Parks. In each of these parks increases were more than 25,000 in excess of the previous year's total. Substantial increases were also registered at Yoho, Fundy, and Prince Edward Island National Parks.

The increased use of the parks is also reflected in the demand for space in public camp-grounds, which are among the popular attractions of the parks. During the 1959 camping season, 303,617 persons were registered as campers. The average stay for each camper was four days, resulting in a total of 1,214,468 camping days. These figures show a very substantial increase over 1958 figures, which indicated a total of 277,000 campers in 1,195,000 camping days. Although facilities for camping have been improved and expanded by the National Parks Service for several years, it is evident



Number of Visitors to National Parks.

that a continued demand for additional camping space will necessitate further extension of existing camp-sites and the development of new ones.

At Tunnel Mountain Campground in Banff, natural gas was installed in several camp-ground shelters. The camp-ground entrances were re-designed and additional service buildings were completed in the trailer park area. The development of new camp-grounds was commenced at Broad Cove in Cape Breton Highlands National Park; at Point Wolfe in Fundy National Park; at several points along the Banff-Jasper Highway in Jasper National Park; near the western entrance of Kootenay National Park; and at Wasagaming Townsite in Riding Mountain National Park. Small camp-sites and picnic areas were also developed in other parks.

The long range development planning section, which was established in 1957-58, undertook preliminary surveys in Prince Albert, Riding Mountain, Fundy, Cape Breton Highlands, Prince Edward Island, and Terra Nova National Parks, as well as in the National Historic Parks in the Atlantic Provinces. Reports covering the planning considerations for each area were prepared to outline the basis for more comprehensive planning. These reports will also help to fit current programs into the long range plan.

A special study of camping problems in Prince Albert and Riding Mountain National Parks was carried out. A considerable number of current projects were reviewed from the standpoint of standards and long-term planning, and desirable standards for the development of natural camp-sites were established. Work on the development of National Parks policy was continued. Preparations were made, in co-operation with the Dominion Bureau of Statistics, for a park use survey to be carried out in the summer of 1960, on a trial basis.

During the past year, the Section has stressed as its immediate objectives and responsibilities, the following:

- (a) compilation and study of information on parks, park uses and on the outdoor non-urban recreation field in general, preliminary to formulation of long range plans;
- (b) a preliminary survey of natural parks and national historic parks to become acquainted with the character and problems of each and to suggest basic considerations in planning;
- (c) investigation and advice on current problems in critical areas with a view to drawing up preliminary development plans or modifying existing proposals to ensure that current developments are consistent with the principles which will govern long-term planning.

Improvement of facilities for park visitors was made with the co-operation of private enterprise. In Banff National Park, 111 building permits were issued for a total construction value of \$842,054. Four permits were for construction exceeding \$25,000 each. Two of the largest developments were an apartment house and a commercial building. Construction was completed on the Sulphur Mountain gondola lift and terminals, and the first phase of the Lake Louise sedan lift and terminals. In Jasper National Park, 105

permits were issued for a total construction value of \$509,670. Development on a lesser scale was undertaken in the permanent townsites in other parks.

Maintenance crews carried out work on scenic drives, trails, camp-ground and picnic areas during the spring months and undertook general maintenance throughout the year. Fringe clearing was completed on the Trans-Canada Highway in Banff National Park to the western boundary. A major project in Cape Breton Highlands National Park was the installation of 30,000 feet of guide rail between Cheticamp and Pleasant Bay.

Some progress was made in the construction of the Trans-Canada Highway through Glacier National Park, but poor weather conditions impeded work. Work on the highway was also carried on in Mount Revelstoke National Park and the overpass surmounting the park highway was completed in October.

As the route of the Trans-Canada Highway through Glacier National Park traverses difficult terrain where avalanches are prevalent, the Department of Public Works will build snow-sheds to cover sections of the highway. Where there are places that this is not possible, other means of avalanche control are being studied. Experiments were made with several methods of controlling avalanches, including earth mounds and other structures to hold back the snow or retard its velocity. Mortar and artillery fire was used to bring down avalanches from the higher elevations before the snow built up to dangerous proportions. These tests of artificial precipitation were carried out by specially trained snow removal crews assisted by Canadian Army personnel. The entire operation is being co-ordinated by the Avalanche and Snow Research Section of the Engineering Division which will supply information for the use of the National Parks Service and for provincial highway departments which administer adjacent sections of the highway.

Special highway projects were undertaken on the Banff-Jasper Highway, Jasper-Edmonton Highway, Miette Hot Springs Road and Maligne Canyon and Medicine Lake Roads in Jasper National Park. In Kootenay National Park, the Banff-Windermere Highway was completed to grade and base course from Miles 0 to 18 and paving carried out from Miles 18 to 25. Guide rail was installed on the section between Miles 32 to 56 which was paved in 1958. Clearing was undertaken from Miles 56.4 to 62.4. In Banff National Park grading on the Banff-Jasper Highway was carried on to Mile 68. In Yoho National Park grading of the Emerald Lake Road was 60 per cent completed. Construction of the Gulf Shore Road from Rustico to New London Bay was continued in Prince Edward Island National Park. Progress was made on the reconstruction of the Cabot Trail in Cape Breton Highlands National Park between Pleasant Bay and the summit of North Mountain.

The development of Terra Nova—latest addition to Canada's park system—was continued. A number of permanent buildings required for administration purposes were completed and additional ones are in the course of construction. The right to operate as a concession a departmentally-owned bungalow cabin development was advertised by public call for

tenders. Progress was made on the construction of a road connecting the Trans-Canada Highway with the Anglo-Newfoundland Development Company road leading to the settlement of Terra Nova. Progress was also made in the development of an adequate forest protection system by the construction of observation towers and fire roads. An important project carried out in the park was the installation of a water system servicing the Headquarters area including the tourist accommodation concession. The Trans-Canada Highway through the park was brought to final grade and will be ready for hard-surfacing following the application of crushed gravel to the surface. When completed, the section of the highway within the park will provide one of the finest avenues of travel in the province.

To conserve natural grazing areas, over-abundant wild animal populations were reduced in Banff, Elk Island, Waterton Lakes, Prince Albert, and Riding Mountain National Parks. During the year, 1,262 elk, 516 buffalo, 156 moose, and 12 deer were slaughtered. Meat and hides resulting from the buffalo slaughter at Elk Island National Park were disposed by public tender. The by-products of the slaughter of other species were made available to the Northern Administration Branch of this Department and to the Indian Affairs Branch of the Department of Citizenship and Immigration for the relief of needy Indians and Eskimos.

Forest fire losses in the national parks dropped to a record low in 1959. A total of 21 forest fires consumed only nine acres with a negligible loss. Of the 21 fires, smokers and lightning each accounted for seven, four started from camp-fires, one from slash burning operations, and one from a mosquito smudge fire. Cause of the remaining fire is unknown.

A general training school for wardens was held at Cuthead Camp in Banff National Park May 19-30, 1959. Wardens from all western parks, except Jasper and Glacier, attended. Instructors were drawn from the Alberta Government Forest Branch, St. John's Ambulance Association, Royal Canadian Mounted Police, Canadian Wildlife Service, and National Parks Branch at Ottawa. The wardens' autumn climbing and rescue school was held in two sessions September 29 and October 10, 1959. Wardens from all mountain parks attended together with three members of the Royal Canadian Mounted Police. In addition, a wardens' ski and winter rescue school was organized during the last two weeks of February, 1960, which was attended by warden staff from the mountain parks, Royal Canadian Mounted Police, and some personnel from the Department of Public Works.

Bowling, golf, and tennis tournaments were staged at Prince Albert and Riding Mountain National Parks. The annual Indian Days celebration was held in Banff July 18-21, 1959. Winter sports events included the International Collegiate and North American Ski meets, the annual men's and women's curling bonspiels at Banff and Jasper National Parks, and the international Ski Tournament of Champions at Mount Revelstoke National Park. The latter event attracted competitors from Austria, Italy, Finland, Sweden, Japan, and the United States, as well as from Canada.

Engineering Services Division¹

The Engineering Services Division increased in size to meet increasing demand for expansion and development in the National Parks Service and the National Historic Sites Division. A highway maintenance engineer was appointed to the western regional office to organize, co-ordinate and standardize highway maintenance methods and procedures in the western national parks. An electrical engineer was appointed to the Ottawa office in order to carry out design work for electrical distribution systems required for such new developments as camp-grounds and trailer parks, as well as for maintenance and improvements of existing distribution systems. Other staff additions were made in the engineering, architectural and landscape planning sections.

The architectural section provided designs, completed plans, specifications and bills of material for a number of structures constructed in the national parks and historic sites. These ranged in size and complexity from two-car garages and one-room warden cabins, to standard three-bedroom houses, large camp-ground toilet and laundry buildings, four-suite apartment units, large service garages, warehouses, central workshops, and park entrance structures. In addition all designs for structures to be erected by private concerns in the national parks were examined to ensure that they complied with good building standards.

The work performed by the landscape planning section consisted mainly of camp-ground, trailer park and picnic area designs as well as ancillary furnishings connected with these areas. These designs will provide a total of 2,000 new tenting units, 600 new trailer stalls, and approximately 1,000 new picnic tables in the national parks system.

Landscape designs were also provided for various building sites and developments throughout the national parks and such national historic parks as Alexander Graham Bell Museum, Port Royal Habitation, and Grand Pré. Several office building landscape schemes were carried out upon request for the Department of Public Works.

Engineers of the Division were responsible for the design of all structures erected in the national parks and national historic sites; water, sewage and electrical distribution system design, and the preparation of specifications for the purchase of motor vehicles, maintenance and construction equipment, as well as construction and building materials. An extensive survey program was carried out mainly to locate scenic and secondary roads in the western national parks, and to provide information for future planning and development. A topographic map of the Point Pelee National Park was completed by aerial photography. Engineering staff, seconded as Resident Engineers to the various national parks, continued to provide on the spot engineering and technical assistance. Engineers supervised the following construction projects.

¹ See Appendix C, No. 4.

The 2,200-foot-long promenade between Dufferin Terrace and the National Battlefields at Quebec City.

The pumphouse, valvehouse and two reservoirs, one storing 350,000 gallons and the other 10,000 gallons forming part of a new water distribution system for the headquarters area at Fundy National Park.

A complete water distribution system at the headquarters area, Terra Nova National Park.

Central service garages at Terra Nova, Riding Mountain, Waterton Lakes, Prince Albert, and Yoho National Parks. Warehouse, workshops building, and gateway entrance structure in Yoho National Park.

Bath-house and swimming pool at Waterton Lakes National Park. Camp-ground and trailer park facilities in Cape Breton Highlands, Fundy, Prince Edward Island, Point Pelee, Georgian Bay Islands, Banff, Waterton Lakes, and Kootenay National Parks.

Major restoration and other construction works at Halifax Citadel, Alexander Graham Bell Museum, Grand Pré, Fort Lennox, Fort Chambly, the walls of Quebec City, Fort Wellington, Lower Fort Garry, Fort Prince of Wales, and Fort Battleford.

National Historic Sites Division ¹

The National Historic Sites Division is responsible for the operation and maintenance of 20 national historic parks and for the care and preservation of 575 national historic sites which have been marked since 1922. Places, including buildings of national historic interest by reason of their age or architectural design, are commemorated on the authority of the Minister who is advised by the Historic Sites and Monuments Board of Canada, a group of 14 authoritative historians representing each province.

During the year, further development was effected in a number of the parks and sites. Construction and landscaping of the Promenade from Dufferin Terrace to National Battlefields Park, Quebec City, was completed. The grounds at Fort Malden National Historic Park were enlarged by the acquisition of three acres of land. Two meetings of the Historic Sites and Monuments Board of Canada were held.

Canadian Wildlife Service²

Waterfowl breeding conditions and waterfowl populations were again studied in co-operation with all the provinces and territories and the U.S. Bureau of Sport Fisheries and Wildlife. Factors affecting the production and survival of some species of ducks were investigated in detail, and the problem of waterfowl damage to crops continued to receive attention.

¹ See Appendix C, No. 7.

² See Appendix C, Nos. 8, 9; Appendix F.

A waterfowl kill survey by mail was conducted in Quebec and New Brunswick. Waterfowl bag checks were also carried out in other provinces to obtain information on hunter success during the hunting season.

Spring counts of woodcock were made in the eastern provinces, and the status of the species was studied.

Among the investigations undertaken was one dealing with waterfowl concentrations in the Western Arctic. Ground investigations were carried out in the Kendall Island and Anderson River breeding areas. Data were obtained on the breeding biology and food habits of and predation on brant, snow geese, swans and white-fronted geese. Surveys were also carried out to determine best locations for needed Migratory Bird Sanctuaries in the Western Arctic.

Organization of banding programs and participation in them were continued. A total of 139,616 records of banded birds was received and processed during 1959.

Administration of the Migratory Birds Convention Act was continued in conjunction with the Royal Canadian Mounted Police and in co-operation with the provincial game branches.

Three new Migratory Bird Sanctuaries were created during 1959, one in Ontario, and two in the Northwest Territories. There are now 98 sanctuaries in Canada with a total area of nearly 6,300 square miles.

Mammal research in the Mackenzie District was concerned with studies of large mammals. Studies of muskrats in the Mackenzie Delta, and beaver and squirrels in Wood Buffalo National Park were continued. Special physiological studies of caribou were continued by Canadian Wildlife Service biologists and by University of Alberta scientists.

An intensive study of diseases and parasites in bison in Wood Buffalo National Park was commenced and was complemented by a similar study in Elk Island National Park.

In the national parks of Western Canada investigations were continued on the biology and management of such big game species as elk, bighorn sheep and goats. A special problem was posed by the forays made by elk onto agricultural lands adjacent to the parks.

Studies of the condition of caribou range in Northern Canada were commenced, with the objective of eventually being able to establish the carrying capacity of the range per unit area.

As an adjunct to other caribou studies an investigation of the biology of northern wolves was resumed with the hiring of an experienced investigator.

This investigation will assess the effects of wolves upon caribou occupying the same ranges in Northern Canada.

In the Eastern Arctic studies of the biology of Arctic foxes were continued, and surveys of caribou and musk-oxen on the larger islands of the archipelago were undertaken.

A three-year co-operative study of Newfoundland-Labrador caribou was brought to a close during the year. During the hunting season of 1959

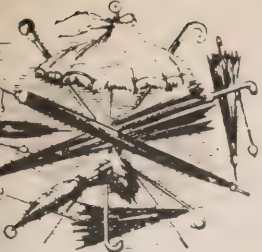
a similar study of the white-tailed deer was commenced as a co-operative venture with the Province of Nova Scotia.

Surveys of lakes and streams in the national parks were carried out by three limnologists and two summer assistants. Several lakes in Jasper, Yoho, and Cape Breton Highland National Parks were treated with fish toxicants. A source of water for the Jasper fish hatchery was investigated. This new water supply makes possible a greater production of trout for stocking with the rearing facilities available. Assistance was given in the rearing and distribution of trout.

Yellow walleye eggs were hatched at Clear Lake, Man., and fry released in that lake. Trout were also planted in nearby potholes and the full-grown fingerlings were transferred to Clear Lake, all marked by the removal of one fin. Splake trout, transferred from the Jasper hatchery, were planted in Clear Lake.

Assistance was given to park authorities in the control of mosquitoes, black flies, schistosomes, algae and aquatic weeds.

The rainbow trout project in Wood Buffalo National Park was continued.



Water Resources Branch

The Water Resources Branch comprises two Divisions: Operations, which is responsible for most of the basic Branch functions, and Hydraulics, which is responsible for special studies required in the solution of waterway problems referred to the Branch. It carries out the systematic hydrometric survey program throughout Canada, studies and analyzes problems involving waterways of federal-provincial and international concern, compiles the water power resources inventory of Canada and administers legislation concerning international rivers, water power and water conservation.

The Branch co-operates with public and private agencies in water-power and water-supply problems, in the maintenance of gauging stations and in the performance of hydrometric surveys and investigations of mutual concern. The Director and senior engineers are active members of numerous federal-provincial and international engineering boards and boards of control established to deal with waterway problems. The Director is also a member of the Northern Canada Power Commission. As a part of a continuing hydrometric survey program, certain gauging stations of international interest are operated in co-operation with appropriate United States Government agencies.

Special investigations were carried out during the year in connection with the Columbia, Fraser, Yukon, Mackenzie, Saint John, and St. Lawrence Rivers. Through its Director as Honorary Secretary of the Canadian National Committee, World Power Conference, the Branch participated in the preparation and publication of the Transactions of the Canadian Sectional Meeting of that Conference which was held at Montreal in September 1958.

Hydrometric Surveys

Conduct of the systematic hydrometric survey program comprises a major part of the Branch activities. A large portion of the program is operated in co-operation with some 81 different organizations including various federal, provincial, municipal, and private agencies. Most of these organizations have been listed in Appendix D, Section 1 of the Department's Annual Report for the fiscal year 1957-58. Field operations of the Branch are carried out through six district offices and 15 sub-offices distributed across the country from Newfoundland to the Yukon Territory. As part of the maintenance of 1,364 gauging stations, field operations included 8,038 stream discharge measurements and 2,299 additional inspections of gauging stations.

Records compiled from the operation of the hydrometric survey program are published in biennial Water Resources Papers, each of which covers one of four main drainages of Canada. Papers covering the Pacific drainage and the Arctic and Western Hudson Bay drainage were issued during the year.

The Current Meter Rating and Experimental Station located at Calgary was operated for the repair and calibration of current meters and related equipment and for the investigation of new types of pertinent instruments. Its services were available to other organizations.

Based upon the flow records from 23 typical rivers distributed across Canada, a monthly statement covering stream flow conditions in Canada was released to the public. The flow records were supplied to the United States Geological Survey which published a monthly summary of stream flow in North America.

During the period covered by this report, mean monthly flows for the 23 typical rivers were generally above the median. The western part of Canada, including the Prairie Provinces and British Columbia, experienced from well above median to excessive runoff for most of the year except for a period late in the spring of 1959 when below median runoff was recorded. Similarly, from well above median to excessive runoff was recorded in Nova Scotia for most of the year. In the remainder of the eastern part of the country, inclusive of Ontario and Quebec, runoff was well above normal during the autumn months and varied from excessive to deficient during the rest of the year.

On several rivers subject to dangerous floods frequent observations of stage were obtained and a flood warning service was provided during periods of high flow. Water levels were obtained at 26 key locations in the Columbia River and Fraser River basins in British Columbia, at about 25 locations in the Saskatchewan River basin in Alberta and Saskatchewan, and to a smaller extent on certain rivers in some of the other provinces. From this information, together with a study of river conditions and current meteorological data, day-by-day computation of probable stages in the lower reaches of these rivers was made available to interested agencies. In Alberta, the District Office at Calgary continued its co-operation with the Bow River Ice Committee in its studies of the flood hazard caused by ice jams in the Bow River.

The customary annual program of snow surveys was carried out in areas where this information is required to prepare estimates of the amount of spring runoff. This program supplements similar programs operated in different areas by other agencies. As the period covered by this report was an alternate year in the biennial survey of representative glaciers in British Columbia and Alberta, regular glacier surveys were not carried out; however, a photogrammetric survey of the Athabasca Glacier was completed with a view to enlarging upon the data obtained in the regular ground survey. Similar photogrammetric surveys will be made of this glacier at appropriate intervals.

Waterway Problems and Water Power Administration

Personnel of the Branch served on 21 international and five federal-provincial boards and committees, which were established to study problems relating to the control of boundary or other waters. In addition, representatives

served on or assisted in the work of seven miscellaneous national committees related to aspects of the water resources field. The district offices assisted other federal agencies with engineering advice on specific water problems and administrative assistance respecting certain federal lands.

In connection with its representation on the International St. Lawrence River Board of Control and the International Lake Ontario Board of Engineers, the Branch participated in an extensive study of the regulation of Lake Ontario to determine from the point of view of all interests the most effective use of storage on the lake in the operation of the St. Lawrence River power project in the International Rapids reach of that river and the seaway project from Lake Ontario downstream to Montreal. This study evolved the plan of regulation of Lake Ontario which has been adopted by the United States and Canada. During the year, the duties of the St. Lawrence River Joint Board of Engineers relating to the control of water levels and flows in the International reach of the St. Lawrence River were assumed by the St. Lawrence River Board of Control.

The Branch continued to provide technical advice to the Department of External Affairs and to the Canadian Section of the International Joint Commission in their considerations and studies of international waterway problems which have arisen on various rivers across Canada. Among the most important studies of this nature undertaken are those of the Columbia River. The main volume of the report of the International Columbia River Engineering Board, outlining alternative plans of development with a primary objective of producing the maximum feasible hydro-electric development of the international basin, was presented to the International Joint Commission in March 1959. Work has been continued towards completion of appendices to the report. The Branch participated in the work of several advisory committees set up by the Governments of Canada and British Columbia to study ways and means of bringing about early development of Columbia River power under co-operative agreement with the United States. In addition the Branch participated in negotiations between Canada and the United States with respect to the most important feature of these studies—the problem of measuring and apportioning between the two countries the downstream benefits in power production and flood control which would accrue in the United States from the use of storage projects in British Columbia. This work is continuing in close collaboration with the International Joint Commission.

The Yukon River has been the subject of previous study to determine the possibilities of diversion of its upper reaches into the Taku River system for power production in Northwestern British Columbia. Since the Canadian portion of the Yukon River with its tributaries lies almost wholly within the Yukon Territory, and hence is a federal responsibility, the Branch continued its power resources reconnaissance surveys, initiated in 1956. In 1959, similar surveys were initiated in the Mackenzie River basin. When this

work has been completed, it will be possible to provide a reliable estimate of the power potential which might be developed within the respective river basins.

The International Passamaquoddy Engineering Board completed its studies and presented its report to the International Joint Commission on development of power by the tides of Passamaquoddy and Cobscook Bays. The International Joint Commission has scheduled public hearings for April 1960 to solicit briefs on the proposals contained in the Board's report.

After consideration of the preliminary report, dated September 1957, of the St. Croix River Engineering Board and the views of various interests as developed at a public hearing in June 1958, the International Joint Commission submitted its report to the Governments of Canada and the United States on the development of the water resources of the St. Croix River basin with the recommendation that it be authorized to continue studies of the possibilities of further development in the basin.

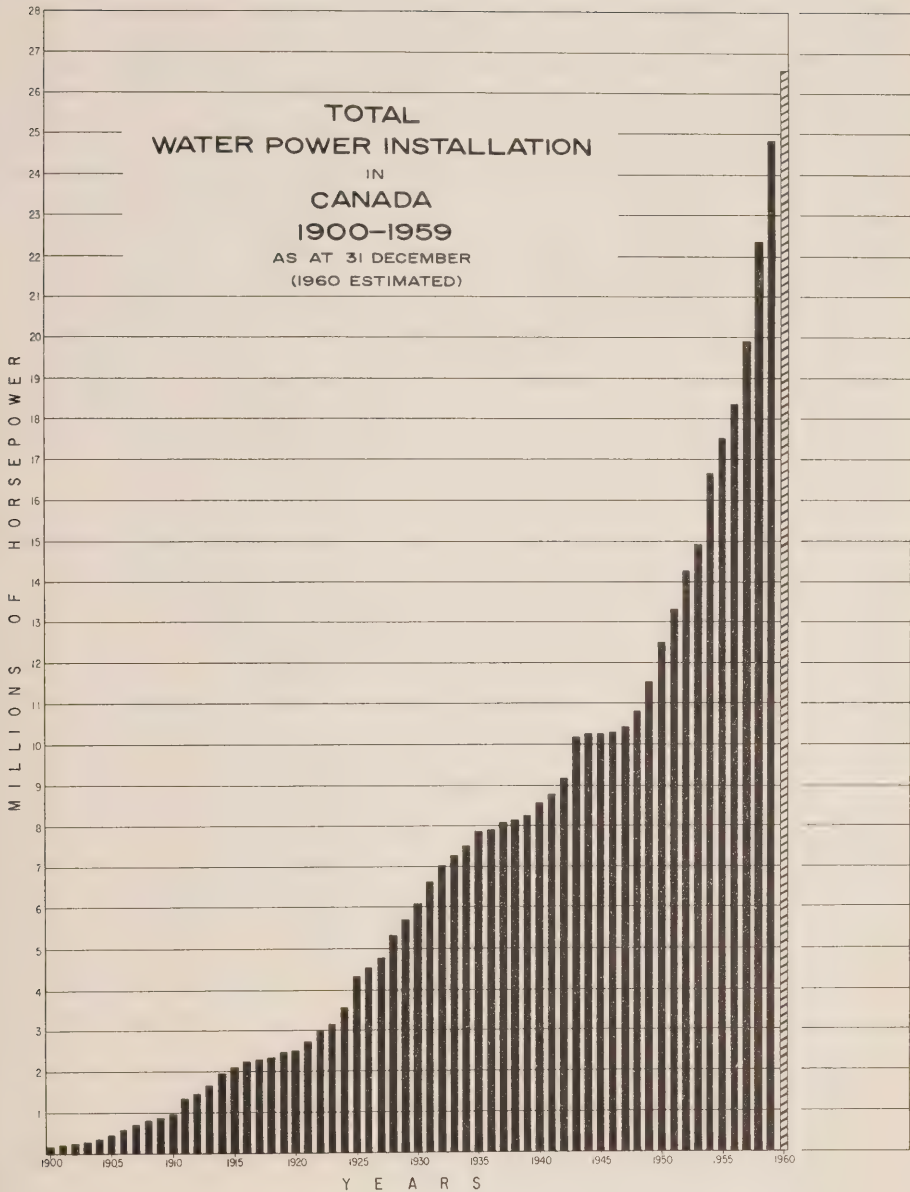
Members of the Branch staff offered technical advice and co-operated with the Secretariat of the Advisory Committee on Water Use Policy in a number of its assignments.

An important part of Branch activities is the provision of technical assistance in investigations and studies being conducted on a joint federal-provincial basis.

The Branch continued to participate in the studies being made under the direction of the Fraser River Board to determine the possibilities of general Fraser River basin development with particular reference to flood control and hydro-electric power generation. This Board was established by the Governments of Canada and British Columbia and in 1956 it submitted an interim report covering investigations to that time. Late in 1958 the Board completed a preliminary report outlining the results of its studies and its recommendations with respect to flood control and hydro-electric power development. Several major schemes of comprehensive development were included in this report. On March 31, 1959, the Board's mandate expired. However, the Board was re-established with effect from April 1 to ensure a continuation of these studies. The Board's further report is scheduled for submission to the Governments of Canada and of British Columbia by September 30, 1963.

The Branch participated in studies being made under the direction of the Saint John River Board. The Board was established in March 1959 by the Governments of Canada and New Brunswick for the purpose of determining how the present and future power developments in New Brunswick would be affected by the development and operation of storage on the upper Saint John River and its tributaries. In addition to power studies, careful consideration is to be given to flood control, navigation, and other related problems affecting the Saint John River and Harbour.

Through its Chief Hydraulic Engineer, as Chairman of the Sub-Committee on Hydrology of the Associate Committee on Geodesy and Geophysics,



the Branch took part in a review of the research programs and needs of hydrology in Canada. During the year a selected bibliography on hydrology in Canada was published in co-operation with the National Research Council and a symposium was convened to discuss the procedures and criteria for spillway design floods.

An important function of the Branch is the administration of the Dominion Water Power Regulations in regard to water power developments carried out on federal lands. During the year, one final licence and one survey permit and one priority permit were issued. The Branch considered several matters regarding other water power developments and collected rentals for each of the nine developments under federal licence totalling \$46,088.57 of which amount \$2,784.32 was collected for the National Parks Branch of this Department and \$31,778.27 for the Indian Affairs Branch of the Department of Citizenship and Immigration.

The Branch conducted its activities relevant to its responsibilities for the administration of the International River Improvements Act and Regulations and the Canada Water Conservation Assistance Act. Annual reports detailing the Branch's activities in this respect are tabled in the House of Commons.

Based upon the Branch's hydrometric surveys, field investigations and other data, the current estimate of the water power resources of Canada is 66,203,000 hp. at ordinary six months flow. During 1959, a net total of 2,508,800 hp. of new hydraulic capacity was added, bringing the total installed capacity of all water power developments in Canada to 24,888,426 hp. New stations and extensions under active construction for operation in 1960 were estimated at about 1,700,000 hp.; others with a total capacity exceeding 2,300,000 hp. were under preliminary construction or were definitely planned for development.

¹ Two regular annual water power bulletins and one bulletin covering thermal-electric installations in Canada were issued during the year, and water power articles were revised for several publications of other agencies.

¹ See Appendix F.



Forestry Branch

The Forestry Branch carried out programs of research directed towards the improvement of forest management and the utilization of forest products. It administered agreements with the provinces through which federal financial assistance was extended for certain forestry activities carried on by provincial departments. Forest surveys were undertaken and advice on forest management provided for forest lands administered by this Department and other federal departments.

The Forestry Branch is organized in three divisions, namely, Forest Research Division, Forest Products Laboratories Division, and Forestry Operations Division. In addition, there are separate sections dealing with Forest Economics and Branch Administration. Results of research conducted by the Forestry Branch in forestry and in the utilization of forest products were made available to the provinces and to the forest industries as a contribution towards improved management of Canada's forests and more effective use of the raw materials they supply.

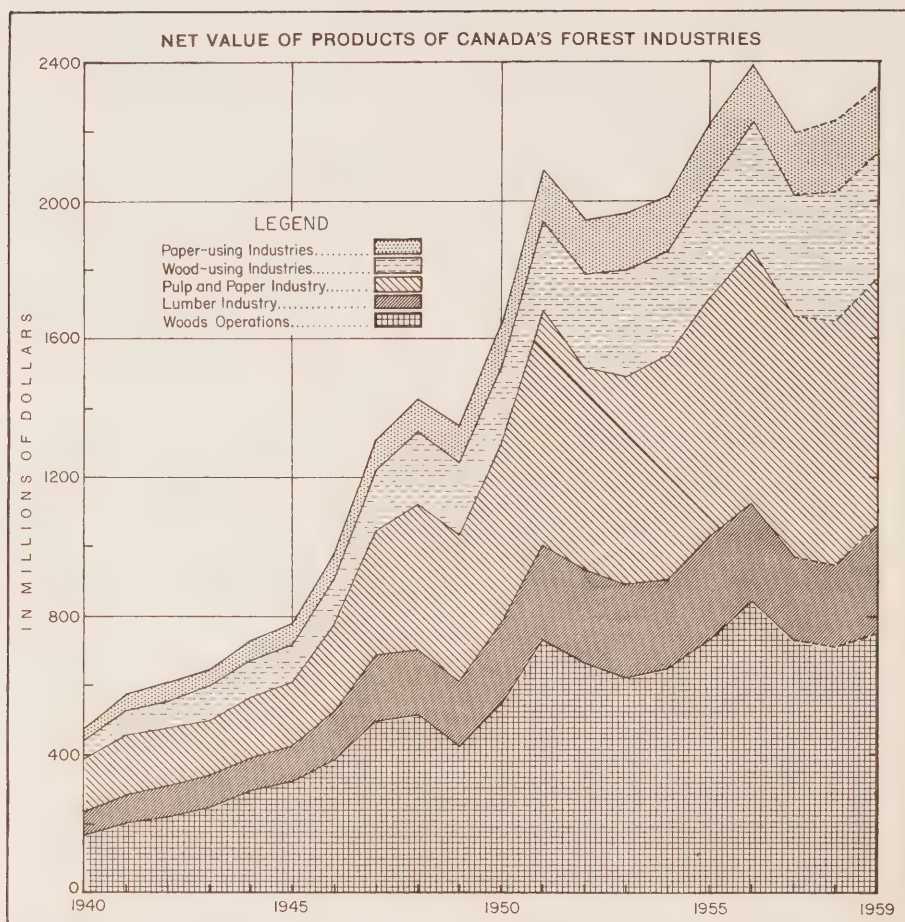
*Forest Economics*¹

Research in the economics of forestry embraced the whole range of economic activities which bear on the use of the forest resources, comprising parts of the fields of consumption, distribution and processing of the products of the forest as well as production and use of the forest itself. It thus provided the basis for intelligent decisions on the economic aspects of managing forest lands and of utilizing their products and services.

The work of the Forest Economics Section included both statistical and economic functions. It maintained basic data on forest resources and on production, consumption and trade in forest products, and also provided advice relating to the economics of forestry to the Director and the departmental Head Office, to other departments and to outside agencies. Its economic activities included the analysis of forestry statistics and legislation relating to forestry, the preparation of economic reports to international organizations and research projects in the economics of forestry.

The Section provided a representative on the Interdepartmental FAO Committee and to the Tenth Session of the FAO Conference in Rome in November, 1959. This officer also attended, as an observer, the Third Session of the Working Party on Forest and Forest Products Statistics held under the auspices of FAO in Geneva in December, 1959. Advisory assistance was given to the Economic and Technical Assistance Branch of the Department of Trade and Commerce in providing training for forestry graduates and students under the provisions of the Colombo Plan and the Expanded Technical Assistance Program.

¹ See Appendix D, Nos. 1, 2.



This graph shows the net value of the products of Canada's forest industries by sectors. The net value is the sale value less the cost of materials, fuel, electricity and the supplies consumed by each process.

Forest Industries

Canada's forest industries in 1959 improved their position over 1958, in keeping with the general recovery in Canadian economic activity. Production and exports of the major forest products increased during the year to set new records or to approach records established prior to the recession which began in 1957. Stocks of lumber and plywood were higher at the year's end than at mid-year, whereas the opposite was true for newsprint.

Lumber production in 1959 increased slightly to about 7.5 billion board feet and lumber exports showed a significant gain over the previous year of 6 per cent to reach 4.2 billion board feet. Exports of lumber to the United States increased by 13 per cent to 3.5 billion board feet, but to the smaller United Kingdom market, exports were reduced by 20 per cent from the 1958 level.

The output of newsprint in 1959 increased by 4.9 per cent to nearly 6.4 million tons, an amount about equal to the record year 1956. The operating ratio showed little gain in the year because of an increase of 3.9 per cent in plant capacity.

In 1958, total utilization of forest products amounted to 3,049 million cubic feet, a decrease of 4 per cent from 1957, and almost 4 per cent lower than the average for the 10-year period 1948-57.

Advisory Committee on Forestry Statistics

The Section's staff continued to co-operate on the Interdepartmental Advisory Committee on Forestry Statistics and provided field staff for the test census carried out by the Dominion Bureau of Statistics in the Galt area of Ontario in June 1959. The separate forestry questionnaire for the 1961 Agriculture Census has now been completed and approved by the Advisory Committee, which has been asked to suggest methods of compilation and analysis for this forestry census by the Dominion Bureau of Statistics.

Sampling of Forest Production on Private Lands

The development of experimental sampling methods for estimating forest production on private lands, started last year in New Brunswick, has been continued in that province. Sampling designs for two districts have now been completed, the compilation being carried out by the Dominion Bureau of Statistics. A start has also been made in the sampling of forest production in Colchester County of Nova Scotia.

In co-operation with the D.B.S. and the Department of Lands and Forests of Ontario, a sample survey of primary production on private forest lands has been developed in the Tweed District and all field work completed. The compilation and analysis are being done jointly by the Forest Economics Section and the D.B.S.

Pilot Study—Lumber End-Uses

A study of lumber end-use has been initiated in co-operation with the Canadian Lumbermen's Association. A pilot study was conducted in the Ottawa-Hull market area and questionnaires on lumber end-use sent to different segments of the industry. It is expected that this study will be the first of a series of market studies covering different forest products across Canada.

Forest Research Division¹

Research activities included fact-finding surveys to evaluate existing conditions, fundamental studies concerning the characteristics and behaviour of forest species and the influence of different factors of their environment, and applied research to develop practical methods for influencing forest development and improving operating and research techniques.

The Forest Research Division conducted research in silviculture, management, ecology, tree physiology, tree improvement, and reforestation from seven district offices located at Victoria, B.C.; Calgary, Alta.; Winnipeg, Man.; Ottawa, Ont.; Valcartier, Que.; Fredericton, N.B.; and St. John's, Nfld.; and at the Petawawa Forest Experiment Station. Research in forest inventories methods and in fire protection was conducted by two sections located in Ottawa.

Silviculture and Related Research

Silviculture deals with the theory and practice of controlling forest establishment, composition, and growth, while forest management is concerned with the application of business and technical principles to the operation of forest properties in order to achieve continuous production, with the net growth and harvest in approximate balance.

The principal tasks within this field of forest research are as follows:

1. Development of satisfactory systems for classifying forests and forest sites as a basis for proper silviculture and management. This includes a study of physiographic and edaphic features, lesser vegetation, and the forest itself.
2. Determination of the silvical characteristics of Canadian tree species and the ecological relationships of the associations in which they occur. Included are fundamental studies of plant growth as related to such factors as temperature, light, moisture, frost, all of which determine the character of the forest.
3. Development of methods of silviculture applicable to the more important forest types and to Canadian economic conditions. Studies are concerned with economic and practical harvesting methods for existing forests and experimentation to ensure future forests of desirable species.

¹ See Appendix D, Nos. 4, 5, 6.

4. Development and testing of practical methods for determining the actual and potential growth and yield of forests. An assessment of the potential productivity of forest sites and an accurate prediction of future yields of forests are essential for long-term management.
5. Development of improved techniques for reforestation and of improved strains of tree species suitable to Canadian conditions. Included are studies for the improvement of planting, seeding, and nursery techniques, and the development through selection and hybridization of better trees for use in reforestation programs.
6. Improvement of methods of organizing forest data into plans of regulation and silviculture for forest areas suitable to different intensities of management. This provides not only technical information for the implementation of management, but also valuable demonstration of various intensities of management in commercially important forest types.
7. Improvement of research methods, mensuration techniques, and the design of experiments. Experimental designs are developed to ensure the validity of results, mathematical functions of growth developed, and mensurational techniques tested and improved.

In all districts, studies of forest and forest site classification were in progress to provide the basic framework within which both research and forest management must be conducted. Fundamental ecological studies, tree breeding, provenance studies, and research in tree physiology continued, with the major part of this work being done at the Petawawa Forest Experiment Station, Chalk River, Ont.

Tests of silvicultural techniques, with emphasis on regeneration following cutting, scarification or fire, continued in all districts. Basic data were obtained as a preliminary to the management of selected and representative forests in each district, and data were collected as a basis for the preparation of yield tables for important species. Studies of different cutting practices were expanded to include additional important forest types. Requests continued from forest industries and provincial agencies for technical assistance in planning such applied experimentation.

Forest Inventories Research

Stand volume tables based on factors ascertainable from air photographs are being prepared to facilitate estimates of the quantity of timber per acre in various forest types. The data of some 1,100 sample plots were compiled by the aid of punched cards and machine tabulation.

Methods of air photography are being investigated to obtain maximum forest information at minimum cost. Very good results were secured with infra red photographs taken with the *Wild Infragon* lens in overcast weather conditions at the Petawawa Forest Experiment Station.

Instruments and other equipment for use in the field and for interpretation of air photographs are being tested. Trials of the "moose-horn", an instrument developed within the Division for the measurement of the density of the forest canopy, confirmed the soundness of the design of the instrument.

Research in methods of field sampling with particular regard to co-ordination with information obtainable from the air photograph is being conducted. It has been recognized that important economies in sampling are obtained when the forest stands are divided into classes by the use of air photographs. It was also found that sampling methods could be considerably simplified and facilitated when maps showing the air photograph classification are available.

*Fire Protection Research*¹

Many problems relating to the protection of forests against fire were studied. Most investigations were made at the request of provincial and other forest protection agencies, which often co-operated in them. Most members of the staff of the Section are in Ottawa, but the research is conducted during the fire season in the field at forest experiment stations or at temporary fire-research stations.

Two field parties completed investigations in British Columbia to obtain data for the preparation of fire danger tables for that province. Analysis of the field data is well advanced and provisional tables should be ready for use during the 1960 fire season.

Forest fire behaviour studies, started last year in Ontario, were continued. A few experimental prescribed burns were conducted at the Petawawa Forest Experiment Station and preliminary work required for additional burns next year was completed. A method for rating the severity of forest fire seasons was developed and published; an exhaustive study of back-pack pumps used in fire control was completed and published.

Forestry Operations Division

This Division administered agreements between the Federal and provincial governments, under the Canada Forestry Act, whereby federal financial assistance was provided to provincial forest inventories, reforestation, forest fire protection, and forest access road construction. Although no aerial spraying was carried out against the spruce budworm in New Brunswick in 1959, a resurgence of the insect has made spraying necessary in 1960. The Government of Canada has again agreed to contribute to the cost of this program. Total federal payments to the provinces under the forestry agreements since 1951 now amount to nearly \$20 million.

Forest surveys were conducted on certain federally-administered lands, and advice and assistance in forest management were provided to other branches and departments of government. Forestry activities at Camp Gage-

¹ See Appendix D, No. 3.

town, N.B., were continued. The educational work of the Division included publication of a new edition of *Forest Conservation*, a booklet widely used by students, conservation agencies, and the public generally.

Forest Inventories **Provincial Agreements¹**

Under the terms of the federal-provincial agreements respecting forest inventory, the Federal Government pays half the cost of the approved programs of the seven participating provinces. These agreements, executed in 1956, provided for completion of the initial inventories by March 31, 1958, and for maintenance of the inventories until March 31, 1961.

Initial inventories covering a national gross inventory area of 1,129,000 square miles have been completed and reports prepared for each participating province. By March 31, 1960, most of these reports were published.

In 1959-60 all the provinces were engaged in inventory maintenance. This work is carried out in areas where disturbances such as cutting and fire, or where growth and changes in stand structure, have significantly affected the initial inventory estimates. For the most part, current maintenance work is being conducted in areas which had been covered by aerial photography prior to 1951 on which the initial inventories were based. In general, inventory maintenance work will be carried out on an approximate 10-year cycle.

Reforestation

Under the agreements, the participating provinces which maintain their reforestation programs on unoccupied Crown lands at a level equal to or above the previous three-year average are entitled to a federal contribution of \$10 per thousand trees planted and \$1 per acre seeded. In addition, the Federal Government contributes one-fifth of the cost of establishing and operating new forest nurseries.

The Province of Prince Edward Island, under a special agreement, receives 50 per cent of the cost of reforestation on waste lands unsuitable for agriculture.

In 1959-60, payments were made to five provinces for the planting of a total of 15,780,000 trees and the establishment and operation of new nurseries in Ontario, Prince Edward Island, and Nova Scotia. Since 1951 the Federal Government has shared in the planting of 105,633,000 trees, the seeding of 7,636 acres, and the cost of 12 new nurseries.

Forest Fire Protection

Federal financial assistance for fire protection was continued to nine provinces under the five-year agreements started in 1957. Federal contributions under these agreements are available for capital expenditures on fire prevention, detection, and suppression equipment, building and improvements, and the hiring of aircraft and vessels.

¹ See Appendix D, Nos. 4, 5, 6.

The federal allotment in 1959-60 was \$1,250,000 as compared to \$750,000 for the preceding year. A like amount is to be made available for each of the final two years of the agreement. The allotment to each province is dependent upon the province's expenditures on fire protection and also its forested area.

Aerial Spraying Operation—New Brunswick

The federal-provincial agreement respecting an aerial spraying operation against the spruce budworm expired on March 31, 1959. By that time investigations by entomologists indicated that the infestation had collapsed and that large-scale spraying was not required in 1959. The spraying operation had resulted in preserving, for future development and use, the forest cover on approximately 6 million acres of land.

Contrary to expectations, forest entomologists reported in 1959 that a sharp resurgence of the outbreak was occurring in central New Brunswick on areas along the southern edge of the previously sprayed areas where extensive tree mortality could likely be expected with a further year's attack by the budworm.

Consequently, the Province of New Brunswick requested the Federal Government to enter into an agreement similar to the previous agreement to combat this threat to its forests. A one-year agreement was concluded whereby the Federal Government would contribute up to a maximum of \$550,000, one-third of the cost of an aerial spraying operation to be carried out in 1960 against the spruce budworm, on an area of approximately 24 million acres. The Government of New Brunswick and the forest industries in the area affected will each contribute one-third of the cost. Spraying operations will be carried out by a Crown corporation, Forest Protection Limited, organized for that purpose.

Forest Access Roads and Trails

Late in 1958, agreements were entered into with eight provinces for the period November 1, 1958, to June 30, 1959, under the terms of which the Federal Government contributed half the cost of constructing forest access roads and trails.

The access roads and trails serve to improve forest fire protection and to aid in the development of the forest resources. Under these agreements a total of 226 projects was undertaken, the federal contribution to the participating provinces amounting to \$2,604,434.

Forest Management

Forest Inventories on Federal Lands

In order to ensure adequate records of wood cutting on federal forest lands, a special timber register was devised providing for current and annual records. This is now in use by the Indian Affairs Branch of the Department

of Citizenship and Immigration and by various agencies within the Department of Northern Affairs and National Resources which control the sale of timber. Forest areas and volumes are now compiled by mechanical tabulators.

During the year there was 14,380 square miles of new forest cover mapping. Detailed forest inventories were completed for 630 square miles. This gives a total to date of 66,000 square miles of completed forest cover mapping, with timber estimates for 32,200 square miles.

One northern field survey party measured 700 field plots, took 3,320 height-diameter measurements, and sectioned 26 trees along the Liard River near Watson Lake, Y.T., to improve upon the reconnaissance survey made in 1954.

A second party made a study of cull in balsam poplar along the Peace River in Wood Buffalo National Park. Eight hundred and seventy-one trees were sectioned and samples of the rot were sent to the Forest Biology Laboratory at Calgary for identification.

A third party mapped and tallied regeneration and growth at Terra Nova National Park, Nfld., for the preparation of a forest management plan for that area. This field party located and measured 374 permanent field plots.

Camp Gagetown, N.B.

The Forestry Branch is responsible for forest fire protection and forest management on the 430-square mile Camp Gagetown Military Area. During the year, 3 timber sales were conducted and 229 timber permits, 9 hay permits and 2 grazing permits were issued. Nine small fires burnt a total area of 107 acres.

Other Military Areas

The Forestry Branch supervised a timber sale at Camp Borden, Ont.

Education¹

The dissemination of information on forests and forestry to the general public and to special groups was carried out through the media of correspondence, publications, photographs, films, and displays. Fifty-five new publications and four re-issues were distributed to a total of 117,000 pieces, an increase of 29,000 over the previous year. More than a third of this number was distributed through schools and forestry organizations.

Increased interest in forest resources was reflected in the number (525) of prints and transparencies supplied to educational institutions and to industry for use in publications and displays.

To assist in the training of fire-fighting crews, a loan service of four training films was maintained.

¹ See Appendix F.

Window displays were shown at the Forestry Branch Head Office, and forest fire prevention posters displayed, through the co-operation of the Post Office Department, in post offices across Canada.

Forest Products Laboratories Division

The past year has been one of considerable activity and progress for the Forest Products Laboratories Division. Of special interest was the increasing demand for research information as exemplified in the presentation of briefs to the Government by the timber industries. This resulted in the preparation of plans for expansion which included intensification of present forest products research and the organization of a field extension service—a new function.

In view of the importance of the U.S. market to the Canadian lumber industry, it was necessary to establish Canadian facilities to comply with the requirements of the U.S. Federal Housing Administration, for mandatory grade marking of lumber used in FHA inspected housing after April 1, 1960. The Canadian Lumber Standards Committee, of which the Chief of the FPLC Division is Chairman, has been designated by FHA as the Canadian agency for approving suitably qualified Canadian lumber manufacturers' associations and inspection agencies. Numerous meetings of the Committee and technical discussions with FHA were held. While discussions are continuing on certain technical points, very satisfactory progress has been made in reaching agreement on grade marks, grading rules, certification procedure, strength values of the various species, and other matters vital in maintaining the export flow of Canadian lumber to the United States.

Personnel of the FPLC were active on committees engaged in the preparation of National Standards for yard lumber, structural timber, glued laminated timber, cedar shingles and shakes, wood adhesives, plywood, wall-board, millwork, wood piling, poles, crossarms and pins, wood preservation, containers, wood ladders, paints and coatings, modular coordination of building materials, and code of recommended practice for engineering design in timber. The leadership, knowledge and technical background of FPLC personnel have assisted in the continued advancement and efficient utilization of Canadian wood products.

Under active study during the year were some 163 research projects at the Ottawa Laboratory and 59 at the Vancouver Laboratory.

Research into the use of wood, wood products and timber fastenings in house construction continued in close co-operation with the Division of Building Research, National Research Council, and with Central Mortgage and Housing Corporation. Studies are progressing in an attempt to bring an engineered approach to the design of family dwellings. Research continued on the variability in strength and related properties of Canadian woods and statistical data were computed and tabulated. A new series of studies was initiated on the strength of western red cedar and red pine poles.

During the past year the FPLC assisted in the investigation of one serious and one relatively minor failure in glued laminated timber construction. Investigations were conducted with a view to isolating the direct causes of the failures and as a result bringing about possible improvements in fabricating techniques. Among other problems under consideration was the improvement of end joint efficiency and promising preliminary studies were made on a new type of finger joint.

Container research resulted in further improvements being made in the performance test for poultry boxes and progress was made in the development of a performance standard for fibreboard egg cases for shipping and cold storage.

An experimental method has been developed for the chemical production of fibreboard from spruce and balsam barks. Studies of extractives in western red cedar resulted in the discovery of new organic chemicals. While some of these chemicals may only be of academic interest, others are expected to have valuable commercial applications.

Simple and inexpensive chemical treatments have made it possible to increase the extent to which wood can be fermented with rumen bacteria, thus opening avenues for the possible transformation of wood residue into high-grade cattle fodder.

Considerable work has been undertaken on methods of treatment of plywood with fire-retardant salts to render the material fire resistant. Research on paint durability had led to a better understanding of the paint blistering process and how best to avoid it.

In the physics field studies were initiated on the relationship between the vibrational and the mechanical properties of wood as a further step towards the development of non-destructive testing techniques for the determination of strength of wood. Work also continued on the effect of preservative treatment and moisture content on the electrical properties of wood, and on the prevention of splitting in railroad ties prior to preservation.

During the year the first commercial models of a sonic device, developed at the Ottawa Laboratory, for the detection of defective glue bonds in plywood, were produced by a Canadian manufacturer. Research was continued on the mechanism of this method of flaw detection and on its application to the testing of other glued assemblies.

Test procedures were developed for evaluating the quality of glue bonds in exterior type flush doors and in lumber core plywood in connection with the preparation of specifications. An electro-optical device under development has shown promise as a tool in assisting to evaluate glue bond quality. A tentative technique was developed for the determination of the degree of cure of hot press phenolic plywood bonds.

Since it has been established that certain fungi inhibit the growth of many common wood-decaying organisms when grown in association, investigations have been made and are continuing on the possibility of using such fungi in preventing the decay of logs stored at sawmills or veneer plants.

From anatomical studies, a method has been developed to define normal characteristics of variable timber species. This method will be of use in appraising the quality of wood for various forest areas and should facilitate the recognition of superior trees.

Both the Ottawa and Vancouver Laboratories continued to work closely with the forest products industries in research on utilization problems. These included studies on the barking, chipping, and outdoor storage of sawmill residue for use in pulp chips, on portable barking and chipping equipment for both sawmill and forest residue, on factors affecting the grading of hardwood trees and logs, on the effect of tree size on lumber manufacture, and on the advantages and disadvantages of pre-logging and re-logging of large timber.

The preparation of exhibits portraying the results of research and illustrating the properties of wood and wood products continued. In addition, 6,597 wood samples of Canadian timber species were sold to the general public.

At both Laboratories, the dissemination of research findings continued to be a matter of utmost importance during the past year. Technical information was supplied in response to over 3,060 inquiries received by mail or resulting from personal visits by manufacturers and users of all forms of forest products. A total of some 42,000 FPLC publications¹ were distributed, 34 articles published in various trade papers and technical journals, and 14 talks and lectures delivered by the staff to industrial and public groups. In addition, the annual "Lumber Seasoning" course was held at the Ottawa Laboratory and the "Improved Sawmilling Techniques" course initiated in 1958 was continued, with six being given during the year to 360 millmen in Quebec, Ontario, Saskatchewan, and British Columbia. Several reports and articles emanating from the FPLC were republished in foreign countries.

¹Appendix F shows list of publications issued during the year.



National Museum of Canada— Natural History Branch

This Branch is concerned with the collection, preservation and display of objects illustrating the geology and biology of Canada. It maintains an active research program in systematic botany, zoology, and vertebrate palaeontology, and publishes scientific reports and popular descriptions based on this research.

The departure of the National Gallery of Canada from the Victoria Memorial Building late in 1959 made available two additional halls for exhibition, to be used for the display of dinosaurs and Canadian mammals, respectively. Another large hall will be used for zoological storage, and additional space will be available for offices, laboratories, studies, and special exhibitions. Preparation of exhibits for the new halls is under way, pending the renovation of the building.

To commemorate the 100th anniversary of the publication of Darwin's "Origin of Species", a special exhibition dealing with organic evolution was prepared and displayed in the main hall, the official opening being November 23.

In June the Director attended the Annual Meeting of the Royal Society of Canada and took part in the Symposium on Evolution. Later he visited field parties in Saskatchewan, New Brunswick, and Newfoundland. The scientific staff of the Branch was increased by the addition of an Assistant Invertebrate Zoologist to act as Curator of the mollusc collection.

Botany

National Museum botanists played a major part in the preparations and activities of the Ninth International Botanical Congress in Montreal, August 19 to 29. They organized and headed field excursions to the Rocky Mountains, the Arctic islands, the vicinity of Churchill, Man., the boreal forests of Ontario and Quebec, and the Mont Tremblant area of Quebec. Guide books were prepared for the Rocky Mountain, Churchill and Boreal Forest trips. Many valuable associations were made or renewed during these excursions, and much additional information on the floras was obtained in the preparation of the guide books, and during the excursions. These guide books will have a value far beyond their immediate usefulness for the Congress.

The collections of the Botany Section of the National Museum constitute the National Herbarium of Canada. This collection was increased during the year by 12,352 specimens, of which 6,617 were received by exchange, 1,400 by donation, and 4,335 as a result of field work, or for identification by members of the staff. Loans to other botanical institutions

totalled 2,140 specimens, and 921 were borrowed by the Section. In continuation of the policy of exchange, 3,255 duplicate specimens were distributed to Canadian and foreign herbaria. Mounted specimens of vascular plants in the Herbarium were increased by 5,955, bringing the total to 260,681. The cryptogamic collection of the Herbarium was increased by 6,153 packeted specimens, making a total of about 90,000. There were 14 additional type specimens added to the collections, bringing these to a total of 1,811 for the Herbarium. Visits by botanists to the National Herbarium were greatly increased this year, partly as a by-product of the International Botanical Congress.

Zoology

During the summer the Chief Zoologist visited the museums of northern Europe from London to Leningrad, studying reindeer taxonomy and distribution. He also attended the meeting of the International Council of Museums in Stockholm, Sweden, July 1 to 8.

Nine field parties carried out zoological research and collected specimens in various areas across Canada. Mammals were collected in Nova Scotia, New Brunswick, the Magdalen Islands, and Alberta. Birds were studied and collected in Newfoundland, New Brunswick, Quebec, Ontario, and Alberta. A major investigation of the amphibians and reptiles of Saskatchewan was undertaken, and a lesser study of those of Prince Edward Island. Fishes were collected from the coastal waters of Nova Scotia and New Brunswick. Surveys were made of the seashore invertebrates of Vancouver Island, and the non-marine molluscs of southwestern British Columbia. A brief expedition to Barbados, B.W.I., added greatly to the collection of marine invertebrates.

In addition to the regular work on the collections, monographic studies are in progress on the caribou, on the birds of Canada, on Arctic fishes, on certain groups of crustaceans, and on abyssal molluscs.

The following additions were made to the zoological collections: 54,200 invertebrates, 12,635 fishes, 2,086 amphibians and reptiles, 2,309 birds, and 2,000 mammals. These include 1,000 birds and 500 mammals obtained by purchase of the private collection of Mr. Leo Jobin, Kelowna, B.C. The number of specimens in the various collections at the end of the fiscal year were: invertebrates, 244,200; fishes, 15,135; amphibians and reptiles, 17,100; birds, 44,000, and mammals 27,500. The number of bird and mammal specimens on loan to schools for teaching purposes was 494.

Palaeontology

Field work was conducted in the valley of the South Saskatchewan River between Saskatchewan Landing and Riverhurst, Sask., for the purpose of obtaining fossils from the Cretaceous rocks prior to the flooding of the area by the South Saskatchewan reservoir. The field party consisted of three palaeontologists from the National Museum and two from the Saskatchewan Museum of Natural History. Partial skeletons and skulls of mosasaurs and plesiosaurs were obtained.

In August the Chief Palaeontologist led a party of palaeontologists from the University of California to various fossil localities in southern Alberta and Saskatchewan. Specimens collected during this tour included an exceptionally fine skull of the so-called giant pig. He also participated in the Ninth Annual Field Conference of the Alberta Society of Petroleum Geologists, presenting a formal paper on fossil vertebrates and conducting the excursion to the Drumheller badlands.

In addition to a number of short contributions, monographic studies are in progress on the fossils of the St. Mary River beds of Alberta, and on Tertiary crocodiles of South America.

The laboratory staff were actively engaged in the preparation of mounted skeletons for display in the new Hall of Fossil Vertebrates. These include the flesh-eating dinosaur *Gorgosaurus*, the duck-billed dinosaur *Hypacrosaurus*, and the plesiosaur *Leurospondylus*. Each of these skeletons will be between 20 and 30 feet long. Arrangements have been made to provide on long-term loan the skeleton of a duck-billed dinosaur for exhibition in the Drumheller and District Museum, Alta.

During the year many specimens of fossil vertebrates were identified on request. Most of these were submitted by the Geological Survey of Canada, and the specimens were subsequently incorporated in the National Museum collection. There are now 4,796 catalogued specimens in the collection of vertebrate fossils, as well as a large backlog to be prepared and catalogued.

National Museum of Canada— Human History Branch

This Branch deals with Canadian anthropology in the broadest sense; it is the museum of Man in Canada. Materials illustrating the physical anthropology, archaeology, ethnology, folklore and folk crafts of the aboriginal and immigrant peoples of Canada are collected, preserved, studied and exhibited. Scientific research and publication are carried on in all these fields.

The acquisition of the entire Victoria Memorial Building for museum purposes will provide two new exhibition halls. With the renovation of the two now in use, the Human History exhibitions will be displayed in a hall of anthropology and archaeology, a hall of the Eskimo, a hall of eastern and central Canadian Indians, and a hall of Rocky Mountain and West Coast Indians. Improved storage facilities for the archaeological and ethnological collections will make these materials accessible and under more direct care. New laboratories for conservation and for musicology are being set up.

One large temporary exhibition was on view in the main hall, under the title "The Changing Eskimo". This compared the physical and social conditions of the Eskimo in early contact days with those of the present time and outlined the role of the various agencies that affect the life of the Eskimo.

During the field season the Acting Director visited two field parties collecting folklore material in Cape Breton. At the close of the year he attended the meeting of the Canadian National Commission for UNESCO, as representative of both Branches of the Museum, and consulted with the University of British Columbia archaeologist on the investigations in the Fraser Canyon.

Additions to the staff included a Senior Ethnologist, who is directing the work of the Ethnology Section as well as conducting research on Algonkian ethnology, and an Archaeologist to resume the Museum's program of archaeological research in Central Canada.

Archaeology

The Archaeology Section includes physical anthropology in its field of interest. Anthropometric studies of 535 male Eskimos were made in the Eastern Arctic during the voyage of the C.M.S. *C. D. Howe*. Some archaeological collecting was also done during the trip. A study of Indian and Eskimo blood types by staff of the University of Manitoba was supported by the Museum.

Eight field investigations in archaeology were sponsored or supported by the Museum. The Senior Archaeologist continued his investigations of stratified sites in southwestern Yukon. Over 1,400 artifacts, chips, bone, and other samples were obtained from five cultures ranging from about 5000 B.C. to about 1850 A.D.

Preliminary survey and minor excavations in the vicinity of Ivugivik, P.Q., and on Mansel Island, N.W.T., yielded one human skeleton, about 2,400 pre-Dorset artifacts (2000 to 1000 B.C.) and about 700 Dorset artifacts (500 B.C. to 1000 A.D.).

At Courtenay, B.C., mounds and a midden were tested, and about 200 artifacts uncovered. Excavation of a site in the Fraser Canyon, near Yale, B.C., by members of the University of British Columbia staff was supported by the Museum. Five successive cultures have been found in stratigraphic sequence, the second oldest being dated by the Carbon 14 method as about 6100 B.C.

Archaeological salvage work was carried out in the valley of South Saskatchewan River, the site of a reservoir under construction, as a co-operative project with the Saskatchewan Museum of Natural History. Survey of about half the area to be flooded revealed numerous sites ranging in age from about 6000 B.C. to 1900 A.D.

Another co-operative project, with the University of Toronto, involved the excavation and survey of the Puckasaw pits near Marathon, Ont. At Prescott, Ont., construction of a bridge approach destroyed a late Iroquois site, from which parts of about 12 burials and some 200 artifacts were saved.

Survey of sites on ancient beaches in the Tadoussac area, P.Q., was carried out under Museum support by a member of the staff of McGill University. During his vacation, the Senior Archaeologist pursued archaeological investigations in southern Puebla, Mexico, under other auspices. These resulted in some important discoveries regarding early agriculture.

Collections were renovated and catalogued in preparation for the new storage arrangements. The number of catalogued artifacts in the Museum is now 110,000 and catalogued human remains is 1,500. One of the largest additions to the archaeological collection came as a result of field work in 1958 by a member of the staff of Michigan State University at the I.G.Y. station at Lake Hazen, Ellesmere Island. This project was supported by the Museum.

Ethnology

Field research was carried out during a three-month period among the Eskimo of Pelly Bay, N.W.T., as part of a continuing investigation into the material culture, folklore and traditional history, as well as the acculturation processes, of various Indian and Eskimo communities. Other projects in this program were carried out by workers under contract; these included a study of non-material Eskimo culture on the west side of Hudson Bay, and of traditional records of the Ojibway Indians on the north shore of Lake Superior.

Plans for an extensive program of Algonkian research were made in consultation with the ethnological and linguistic staffs of various Canadian

universities. An annotated working bibliography of Canadian Indians and Eskimos was begun, the section dealing with the Montagnais-Naskapi being completed.

In folklore, field studies were carried out by staff members in the French-speaking communities in New Brunswick, Cape Breton Island, N.S., and Gaspé and the Gatineau Valley, Que., and in the English-speaking communities in New Brunswick. Workers under contract investigated the folk-music of Newfoundland and New Brunswick, the Micmac folklore of Gaspé, the Amish folklore of Ontario, the material ethnography of French-speaking communities of eastern Quebec, and the ethno-linguistics of French-speaking communities on the north shore of the St. Lawrence River and in Newfoundland. A scientific study of the Museum's collection of folk-music was begun by the employment under contract of a trained musicologist.

During the year, 374 artifacts from Indian, Eskimo and French-Canadian communities were added to the collection, and 267 recordings of folklore and folk-music were made. Catalogued objects in the ethnology collection total 23,839, and recordings are 17,120 in number. A new catalogue of the ethnological collection is being prepared.

Canadian War Museum

The War Museum is concerned with the collection, preservation and display of objects related to the military history of Canada. The larger part of the collection pertains to the two World Wars, in which Canadian achievements greatly shaped the development of our nationhood.

Two special exhibitions were held during the year in connection with the 50th Anniversary of Powered Flight in Canada. So great was the public interest in these exhibitions that a special exhibition is being prepared on request in connection with the celebration of the 50th Anniversary of the Royal Canadian Navy in 1960.

The number of specimens added to the collection was 382. Loans made to other museums, and for special exhibits totalled 26. Conducted tours were provided for 340 groups, a total of 10,236 individuals, mainly from schools, colleges, and the Armed Forces. Total attendance for the year was 126,134.

Common Services ¹

The Education, Library, Photography and Mechanical Sections serve both Branches of the Museum.

The Education Section is responsible for all interpretative services other than exhibition. This includes free lectures and film programs for both adults and children, guided tours for visiting groups and the sale of books, photographs, and specimens. Loans are made to schools throughout Canada of film strips and motion-picture films, and assistance is given to the Zoology and Archaeology Sections in providing loans of specimens. Prints from the

¹ See Appendices E and F.

Museum's large collection of photographs are supplied at cost. Many requests for information or publications are handled by correspondence.

During the year, 23 lectures were given in English, to a total audience of about 6,500. Two French lectures were offered to a total attendance of 102. The children's program included 23 presentations, the combined attendance being 25,470. A display of books related to each presentation was provided, courtesy of the Ottawa Public Library. The weekly film showings in July and August, under the title "Canada in Colour", consisted of eight programs, with 48 showings and a total audience of 5,385. Films for these programs are provided mostly by the National Film Board.

An innovation this year was the offering of drawing and painting classes for children between the ages of 9 and 12 years. This was designed to increase the children's awareness and understanding of objects in the Museum, and to provide a constructive Museum activity. Thirteen of these Saturday morning classes were given with an average attendance of 65. Approximately 60 loans of films were made to schools, Boy Scout groups and others, as well as some film strips, nature recordings, and mounted photographs. Sales of books, cards, pamphlets and coloured slides at the sales desk totalled \$1,966.20. The facilities of the Museum lecture hall were made available to 39 educational, scientific, or cultural organizations. A total of 136,150 persons visited the Museum during the year.

Four thousand, five hundred persons visited the Museum in guided tours, making up 103 groups, 46 of which were from outside of Ottawa, and 15 of which were French-speaking.

The Library, which had formerly been combined with that of the Geological Survey, became a separate unit in August with the moving of the Survey to its own building. During the year a number of gifts of books and journals were made to the Library by staff and former staff members, and by other Government agencies. Most important of these was the library of Dr. R. M. Anderson, former Chief Biologist of the Museum, which is mainly devoted to Arctic biology and exploration. The Library participated in the Darwin Centenary exhibition by providing through inter-library loans and gifts a first edition of *The Origin of Species* and fifteen translations.

The Photography Section had formerly operated as part of a combined photographic unit with the Geological Survey. One photographer remained with the Museum when the Survey moved but an Assistant Photographer has been engaged, and new equipment acquired. The Section is now in a position to continue to provide positive prints and enlargements, and to process some negatives. Total items of photographic work completed during the year numbered 8,973.

The Mechanical Section is responsible for the electrical and mechanical maintenance within the Museum building, and for the design, construction and installation of exhibition and storage cases and other physical facilities. The establishment includes a carpenter shop, a metal and machine shop, a designing and printing room, and a plastics workshop. Much of the time of the Chief of the Section and his draughtsman was taken up in preparing

detailed plans and specifications for the renovation of the building, and in maintaining liaison with the Department of Public Works. Preliminary work was done on the cases for some of the new exhibition halls. Setting up of the Darwin Centenary Exhibition involved the intensive efforts of the entire Section for several weeks. Projects completed during the year numbered 255, in addition to constant routine maintenance. In October the Chief of the Section visited museums in Washington, Philadelphia, and Corning, N.Y., to observe methods in the design and preparation of exhibits.



Canadian Government Travel Bureau

Since 1934 the Canadian Government Travel Bureau has been the federal agency directly responsible for encouraging more travel in Canada by people from other countries. Through various methods it promotes and assists travel to Canada particularly by United States tourists. Its activities contribute materially to the welfare of the tourist business which has a value to the national economy greater than any Canadian export except newsprint and wheat.

In 1959, according to preliminary Dominion Bureau of Statistics estimates, tourists from other countries spent \$393 million in Canada, \$44 million more than in 1958, and the largest increase since 1946. U.S. tourist expenditures in Canada, which make up the major part of this total, were \$351 million, up \$42 million from 1958. Visitors from overseas spent \$42 million, \$2 million more than they spent in 1958.

On the other side of the coin, Canadian travel expenditures outside their own country continued to increase. In travel outside Canada, Canadians spent \$593 million, \$51 million more than in 1958. Most of this increased expenditure was in the United States where Canadian spending was \$445 million, up \$32 million from the previous year. In overseas countries, Canadian spending increased \$19 million to \$148 million.

While the deficit on Canada's travel account with all countries was \$200 million in 1959, an increase of \$7 million, the deficit on the travel account with the United States dropped \$10 million. Greater expenditures by Canadians travelling overseas and only a nominal increase in spending by overseas visitors to Canada increased the deficit on the overseas travel account by \$17 million.

The Canadian Government Travel Bureau promoted travel in Canada from its Ottawa headquarters and its New York and Chicago offices. Advertising campaigns and various forms of publicity in U.S. media attracted a record number of requests for information on travel in Canada. Most of these requests were handled by the Ottawa staff, but the facilities for receiving information directly from the New York office in the Canada House Building on Fifth Ave. and the Chicago office at 102 W. Monroe St., as well as Canadian consulates in the United States, were used extensively.

In November, 1959, the Canadian Government Travel Bureau sponsored the 14th Federal-Provincial Tourist Conference at Ottawa. Delegates from the Federal Government, the provincial governments, transportation companies, and the Canadian Tourist Association attended. The Conference continues to be a valuable aid to the co-ordination of tourist promotion by national, provincial, regional, and local agencies.

To handle the increasing volume of work and in an effort to provide a 24- to 48-hour service in responding to inquiries, the Bureau continued to mechanize its service operations during 1959. New equipment was installed and new procedures were established to expedite the flow and

routing of work especially during peak operational periods. As a result of improved organization and distribution facilities, the Bureau sent out a total of 584½ tons of mail during the 1959 calendar year. In one 36-hour period during April, 1959, over 22 tons of mail were shipped.

It is believed that the Canadian Government Travel Bureau now handles more inquiries than any other national travel office in the world and mails the heaviest volume of individual items to points outside the country.

For the 1959-60 season the Bureau allocated \$1,468,000 for advertising in United States magazines and newspapers. Of this amount approximately \$858,000 was used for a general magazine campaign, \$310,000 for a general newspaper campaign (including production charges), and \$300,000 for a special Atlantic Provinces campaign. The 1959 general campaign ran in 51 different daily newspapers with a total circulation of 27,291,188. Advertising for the Atlantic Provinces was placed in eight magazines with a combined circulation of 21,096,848, and in 25 newspapers with a total circulation of 14,382,933.

Travel Counselling

As a result of this extensive advertising campaign, the Bureau serviced a record 759,884 requests for Canadian travel information. Of this total, approximately 652,862 were serviced from Ottawa; 67,183 by the New York Office, 18,006 by the Chicago Office, and 21,833 by Canadian Consulates in the United States. (A graph illustrating the increase in demand for Canadian travel information appears as part of this report.)

Of the 652,862 inquiries serviced in 1959 from Ottawa, 300,186 were requests for detailed information on travel in Canada, which required special attention by the Travel Counselling Section. These requests, after being serviced with appropriate material from Ottawa, were referred to provincial and local bureaus across the country as well as to all main transportation companies.

A total of 19,380 inquiries were given replies personally dictated by the Travel Counselling staff. A new system incorporating standard pre-arranged paragraphs was adopted in January, 1960, to facilitate and expand this detailed travel information service to correspondents. As a result, the first few months of 1960 showed a marked increase in the number of dictated replies over the same period of 1959.

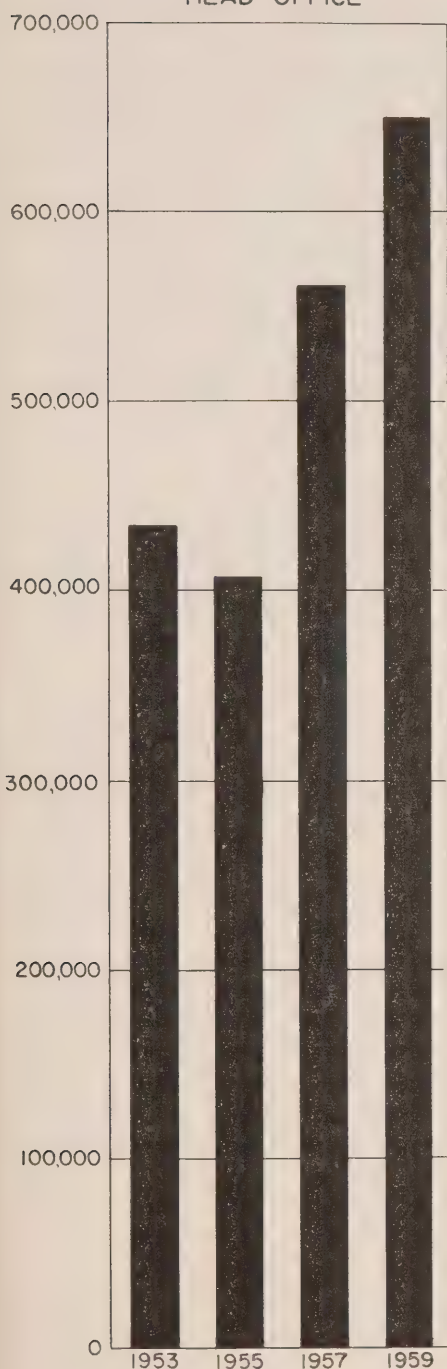
The Travel Counselling staff assisted in revising 15 service booklets.

Research and Statistics

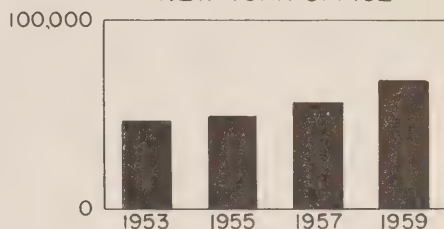
Statistical and research facilities were enlarged, in April, 1959, to enable the Bureau to keep informed on the quickly changing patterns of international travel-behaviour and to meet increasing competition.

REQUESTS FOR TRAVEL INFORMATION

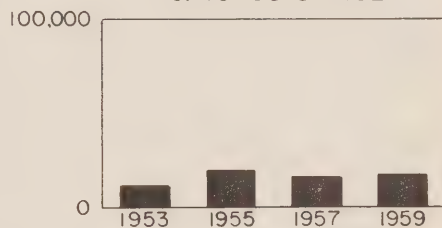
OTTAWA
HEAD OFFICE



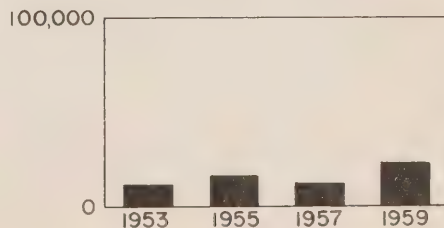
NEW YORK OFFICE



CHICAGO OFFICE



CANADIAN CONSULATES
IN UNITED STATES



The functions of this section now entail continuous studies of the results obtained from various media in which the Bureau advertises; the thorough surveying of visitors to Canada who respond to Bureau advertising; and the assessment of potential markets.

During 1959 an accurate count was kept of responses to newspaper and magazine advertisements, and the relative effectiveness of each medium was established. These analyses were reviewed on a monthly basis during the advertising year to enable a continuing assessment of progress. At the end of the year a survey was made of 137,000 respondents serviced by the Bureau and the 24,000 completed and returned questionnaires provided a great deal of useful information on American travel habits.

In addition, this Section performed analyses of potential markets to discover the areas of the world that would respond most effectively to future Bureau advertising. By exchanging statistical information with other countries, states, and provinces, the Bureau was able to expand its file of vitally useful research data.

Publicity

Publicity programs in the United States, in Canada, and in overseas countries included the regular mailings of release material to more than 2,200 media. There were mailings of 10,616 glossy prints in black and white and the loan of 1,218 colour transparencies to magazines and roto-gravure sections during the fiscal year.

A special feature service resulted in 524 requests from magazine and newspaper editors for articles on travel in Canada and 485 placements in United States newspapers of three photo featurettes. Travel features were also prepared for specific newspapers and were designed to take advantage of space in week-end travel sections. This program resulted in 450 direct placements.

Besides making direct placement of Canadian travel publicity material, the Bureau helped many editors in the United States and overseas countries develop their own Canadian travel stories.

During July and August, picture-taking assignments were carried out for the Travel Bureau by a National Film Board of Canada photographer, and by five private photographers. The program included coverage in sections of each of the ten provinces. A member of the Publicity Section also made a photographic tour of the Yukon Territory while assisting the Travel Bureau of that Territory. As a result of their program a good new selection of black and white and colour still photos were obtained for advertising, publicity, and publications use.

Travel Films

During 1959 it was possible to maintain and increase the effectiveness of the Canadian Travel and Wildlife Film Program while proceeding with an updating program. Some 1,593 prints, worn or obsolete, were withdrawn

from circulation while 1,561 were added, 935 of these purchased by the Bureau. The National Film Board's offices in New York and Chicago now service 563 outlets in the United States and have provided 5,448 prints of the 158 titles available. New outlets and circuits are still being organized.

Recorded screenings totalled 98,913 with an attendance of 5,379,512 at these showings.

There were 568 prints of 76 titles available from the free travel-television library in New York. An estimated audience of 60 million in 91 cities covering 36 states was reached by the 1,852 telecasts (of which 299 were in colour) over 104 television stations.

A second series of ten televisits provided by the Travel Bureau was entered in the free travel-television library with 250 prints being in distribution at the end of 1959. Fifty sets of the first series introduced in June, 1958, are now in use. These televisits were telecast 1,945 times over 36 stations in 34 cities covering 20 states.

The Canadian Travel Film Committee continued its function as an advisory body. Its sub-committee on Travel Film Evaluation accepted 16 new film subjects for the program. The Travel Bureau has requisitioned an initial supply of prints of 15 of these films. At the present time this Committee is seeking provincial co-operation in a joint program to produce a greater variety of televisit subjects. This would provide a greater variety of material for wider distribution.

Publications

In the fiscal year 1959-60 the Travel Bureau produced over 60 publications including booklets, folders, pamphlets, and maps for both the Travel Bureau and the National Parks Branch at a total cost of \$379,802. The distribution of these in the calendar year 1959 amounted to over five million copies.

In addition to the regular distribution of literature through the servicing of over half a million individual inquiries, the Bureau carried out a regulated program of promotion and distribution of its literature to important travel outlets in the United States and abroad. The demand for Canadian travel literature from these outlets has increased considerably each year. Among such outlets in the United States are automobile clubs, travel agencies, transportation companies, and personnel departments of industrial organizations.

During 1959 the Travel Bureau worked out a co-ordinated distribution program to ensure that important outlets in countries other than the United States are kept supplied with adequate quantities of Canadian travel material and posters. This program was effected in co-operation with the Departments of External Affairs, Citizenship and Immigration, and Trade and Commerce; also with main transportation companies such as Trans-Canada Air Lines, Canadian Pacific Airlines, Canadian National Railways, and the Canadian Pacific Railway.

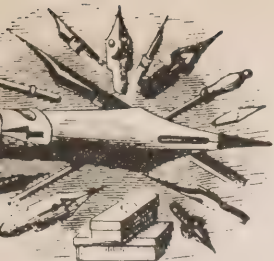
To assist in promoting attendance at numerous conventions being held in Canada and to encourage pre- or post-convention travel, the Publications Section carried out, in co-operation with convention authorities and host cities, special mailings of material to prospective delegates.

A popular and successful promotion program was undertaken in co-operation with the Department of External Affairs at the request of The Boy Scouts of America Association. The Association sponsored a special educational program during March under the theme, "Canada, Land of The Mountie", and the Travel Bureau contributed by providing 400,000 copies of its folder, *Canada—Vacations Unlimited*.

All publications were brought up to date for the 1960 season. New folders prepared and issued included *Royal Tour of Canada* and *See The St. Lawrence Seaway Through Canada*. The planning and development of a new 50-page colour booklet entitled *Invitation to Canada* progressed in the latter part of the year. Preliminary work was undertaken in the production of a new *Highway Map of Canada and the Northern United States*.

The Travel Bureau again produced and distributed posters and leaflets encouraging United States visitors to exchange their dollars for Canadian funds at a bank and to use Canadian currency while in Canada. This extensive promotional program was carried out with the helpful co-operation of customs authorities and provincial and local associations, including chambers of commerce, boards of trade, and transportation companies across Canada. A special poster outlining the customs exemptions on purchases by U.S. residents was also distributed.

Over 28,000 colour posters were distributed to important outlets in the U.S.A. and overseas countries. United States distribution was carried out through promotional mailing programs and through the Travel Bureau's offices in New York and Chicago. Special programs included distribution of posters through the offices of manufacturers to retail establishments in the U.S.A. for use in window displays on Canada. Overseas distribution was, for the most part, arranged through Canadian Embassies, consulates, and transportation companies.



Administration Services

During the year under review the office of the Chief Administrative Officer and the five divisions served the Deputy Minister and the Department generally, and assisted the Branches with administrative and technical services.

Economic Division

The primary function of the Economic Division is to carry out economic research and to provide advice on economic questions relating to the Department's role in administering and developing the northern territories, and in the management of resources generally.

The division's inquiries and advice ranged across the entire area of departmental activity. As in past years, economic consideration relating to transportation, mining and energy continued to hold a primary position in the division's work. Economic inquiries were carried out also with respect to territorial revenues and expenditures, forest and other renewable resource development, processing and marketing of resources, tourism in Canada, and in other subject areas as circumstances required.

Among its specific projects, the division undertook analytical work related to the Federal-Provincial "Roads to Resources" program and the territorial development roads program, to the Great Slave Lake railway, and to the acquisition by Canada and disposition of the Canol pipelines.

The division provided consultation on matters of policy as well as of substance, and members of its staff represented the Department on a number of interdepartmental and special committees which met during the year.

Editorial and Information Division

This division provides editorial and information services to all branches of the Department.

Editorial advice and assistance was offered in the printing of the 149 publications—mostly dealing with technical subjects—that were produced by the Department during the year. The division continued to provide the secretariat for the Departmental Publications Committee.

Information activities included the writing and distribution of 101 press releases and the supply of editorial information and photographs in answer to requests from daily newspapers, wire services, general and trade magazines, encyclopedias and year books, and radio and television news services.

Special Arctic exhibits were presented at the Calgary Exhibition and Stampede and the Regina Exhibition in the summer of 1959. Total attendance at the Calgary Stampede was 600,000 and at the Regina Exhibition 213,000. An exhibition of 100 pieces of Eskimo stone sculpture, which had

been touring Europe since 1956, returned in June, 1959, and was prepared for exhibit in the countries of Eastern Europe under the auspices of the Department of External Affairs in 1960-61.

A large increase in the requests for information received by the division was noted during the year. There were 29,408 mail inquiries for information and 65,640 information pieces, usually in mimeographed form, were distributed in answer to these and other requests.

Legal Division

A complete legal consultative service to the Department is provided by the legal officers of this division. The division represents the Department in litigation and advises on the legal implications of policies, acts and regulations. Advice was given during the year on the drafting of contracts, agreements, legislation and regulations and legal counsel provided to the Councils of the Yukon Territory and the Northwest Territories.

Personnel Division

The Personnel Division is responsible for planning and executing the departmental personnel policy and provides an advisory service on personnel administration. Records designed to produce a variety of information affecting staff are maintained. Specialized services are provided in establishment and classification, staff training and employee welfare.

Members of the Personnel Division take an active part in the selection of candidates for promotion and during the year 180 competitions were held in the department. During the fiscal year, total departmental establishment of full-time positions was 2,790, an increase of 370 from the previous year. In addition to full-time employees, the department also employed a substantial number of seasonal and part-time persons. Staff are located in every province of Canada and both northern territories.

Purchasing Division

The Purchasing Division is responsible for procurement of all supplies and equipment needed by the Department. It represents the Department in dealings with suppliers; examines and investigates equipment and supplies, and recommends what should be purchased; operates the central stationery stores; and assists in co-ordinating the delivery of supplies in northern Canada.

During 1959-60 the division received 16,296 requisitions and issued 14,801 purchase orders. The amount of building materials purchased for the National Parks Branch and the Northern Administration Branch increased considerably during the year. New schools and residences in the Northwest Territories were equipped and supplied and prefabricated housing units were purchased by competitive tender for northern use.

The policy of consolidated purchases of items in common use by all branches of the Department was continued with benefits to both cost and delivery.

The supply of heating oil to northern communities continued to be a major responsibility of the division.

Roads to Resources **Special Programs**

Administration Services was responsible for the staff-work involved in negotiations with the provinces on the Federal-Provincial Roads to Resources program. Road construction projects proposed by the provinces were reviewed at a number of meetings of the Interdepartmental Roads Appraisal Committee on which the Departments of Public Works, Mines and Technical Surveys, and other interested federal agencies are represented.

By the end of the year, agreements had been signed with nine of the ten provinces. These envisaged the construction of over 4,100 miles of development road, at a total estimated cost of about \$145 million (see map pages 34 and 35). The federal government will share equally in the cost of these roads, up to a maximum contribution of \$7½ million in each participating province.

Campgrounds and Picnic Areas

Administration Services was also concerned with two co-operative federal-provincial programs for the development of campgrounds and picnic areas. One of these, designed to provide facilities along the Trans-Canada Highway, involves a federal contribution of \$2 million divided between the provinces in proportion to the highway mileage in each. The objective is to provide for a picnic ground every fifty miles, and a campground every hundred miles along the route of the Highway.

The other program, called the Winter Work Campgrounds—Picnic Areas Program, placed no limit on the total amount of the federal contribution or the sites of the developments. The assistance was designed to encourage added employment during the winter months and to help the provinces in meeting the rapidly growing demand for camping facilities. During the winter of 1959-60, seven provinces participated in this program, and federal payments to them totalled over \$1,100,000. About 5,000 man-months of employment were provided.

Northern Co-ordination and Research Centre

Under the Northern Affairs and National Resources Act of December 16, 1953, the Minister was given the responsibility for fostering knowledge of the Canadian North and of the means of dealing with conditions related to its further development. The fostering of such knowledge is done in part by scientific investigation. To assist in the carrying out of this responsibility, the Northern Co-ordination and Research Centre was established in 1954, reporting through the Secretary of the Advisory Committee on Northern Development.

The Northern Co-ordination and Research Centre has three main functions: the providing of information on the North, the co-ordination of research on northern subjects and the carrying out of research in Northern Canada, especially in social anthropology. Information about the North is provided primarily through the Northern Affairs Library, which is part of the Northern Co-ordination and Research Centre. This is a small specialist library and has responsibility for the purchasing, cataloguing, and storing of books, periodicals, reports, and microfilmed material dealing with Northern Canada and other northern areas, and any subjects related to the activities of the Department in the North. It provides reference material to the Department and other agencies, maintains a map collection of the North for reference purposes, catalogues and files photographs of northern subjects, and distributes accession lists, periodicals, books, and bibliographies to members of the Department and other agencies. The library is responsible also for providing a reference library service for Northern Administration Branch field offices. At the present there are 4,756 books and 120 periodicals in the library. During the year, loans of 1,685 books were made, 3,467 periodicals were circulated, and answers were provided to 579 inquiries.

The co-ordination of northern research is carried out partly by the issuing of Licences to Scientists and Explorers, and Permits to Archaeologists and Ethnologists, and partly by the provision of the secretariat for two research committees. During the year, 96 Scientists and Explorers Licences were processed for issue by the Northern Co-ordination and Research Centre, and 7 Permits to Archaeologists and Ethnologists. Officers of the Centre serve as secretaries on the Scientific Research Sub-committee of the Advisory Committee on Northern Development, which co-ordinates government research on the inter-departmental level, and the Northern Research Committee, which co-ordinates northern research within the Department of Northern Affairs and National Resources.

The Northern Co-ordination and Research Centre promotes and encourages government and non-government agencies to undertake research in the North, and assists in planning projects for northern development, especially those affecting the Eskimos. It arranges for the working up and publication of materials and results of expeditions in Northern Canada which have not been adequately published. It sponsors and conducts research in Northern

Canada, especially in the field of social anthropology, by hiring scientists on a seasonal basis, under contracts with scientists, and by means of grants-in-aid.

Research of a general nature is carried out in fields for which no other government agencies are responsible, or in studies in which these agencies have a marginal concern. During the year, such studies included a geographic survey of settlements in the Mackenzie Valley to determine the bearing of geographic factors on the location of such settlements in relation to the provision of services and utilities, a biological study into the effects of environmental temperature and humidity on new-born caribou calves, a study to evaluate the Soviet plan to ameliorate the Arctic climate by the diversion of ocean currents and other means, and a survey of library facilities in the Northwest Territories with the aim of outlining legislative and financial requirements for the setting up of a library system there. In addition to the above, a sum of money was provided to aid in the publication of a study of the historical and legal bases of Canada's claims in the Arctic.

The larger number of scientific projects carried out by the Northern Co-ordination and Research Centre are in the field of social anthropology. During the year, six anthropological studies were undertaken. Of these, five were new studies, and one, at Frobisher Bay, was the completion of a study begun in 1958. The new anthropological studies included an examination of the subsistence economy of the Dogrib Indian community at Lac la Martre. The Eskimo and Indian community at Aklavik was studied in an effort to determine the effects on the people of this community of a move to the new townsite at Inuvik and to formulate means of facilitating the move. The Eskimo community at Sugluk in the Province of Quebec was studied, as were the communities at Baker Lake and Eskimo Point in the District of Keewatin.

Secretariat, Advisory Committee on Water Use Policy

The Advisory Committee on Water Use Policy is an interdepartmental committee consisting of the deputy ministers, or their representatives, of the following departments: Agriculture, Finance, Fisheries, Mines and Technical Surveys, National Health and Welfare, Northern Affairs and National Resources, and Trade and Commerce, together with the Under-Secretary of State for External Affairs and the Secretary to the Cabinet. In addition, representatives from other federal agencies may be invited to attend from time to time. The purpose of the Committee, established in 1955, is to advise the Minister of Northern Affairs and National Resources on federal policy regarding water uses.

Since 1956, a Secretariat has assisted in the work of the Committee. The Secretariat is responsible for liaison with the various federal agencies concerned with development and use of water, and for preparation of background papers on various subjects to be discussed by the Committee. In addition, the Secretary is to act as secretary to the Canada-British Columbia

Policy Liaison Committee. The Secretariat is participating in the national "Resources for Tomorrow" Conference by undertaking two papers dealing with water matters.

In 1959-60, the Advisory Committee met to consider such matters as water pollution, the Passamaquoddy tidal power project and the Columbia River. While much of the Committee's time has been taken up by international water problems, domestic problems also received a good deal of attention.

Resources for Tomorrow Secretariat

During the year being reviewed a Secretariat was appointed to prepare for the Resources for Tomorrow Conference, which will be held at Montreal October 23-28, 1961.

The Secretariat consists basically of a Secretary, an Assistant Secretary and an Administrator with supporting stenographic and clerical staff. While a unit of the Department, the Secretariat is responsible to a National Steering Committee chaired by the Minister of Northern Affairs and National Resources and consisting of a cabinet minister from each provincial government. As the fiscal year ended, the Secretariat was adding research co-ordinators to its staff from the department, other federal departments and resource planning groups in general.

In December, 1959, the Secretariat met for the first time with the National Steering Committee and advised on the scope and objectives of the Resources for Tomorrow Conference. The conference will deal with six renewable resource areas—water, agriculture, forestry, fisheries, wildlife and recreation. The emphasis will be placed on the close relationships of these resources and the methods of attaining more integrated management so that the resources may be used more effectively to service the present and future needs of Canadians.

Since detailed documentation of all aspects of renewable resource use and management is essential to the Conference's success, the Secretariat began preparing a list of background papers. Advisory groups were formed to recommend suitable papers and qualified authors for each of the six general subjects of the Conference. The recommendations of the advisory groups were to be submitted for approval to the policy sub-committee of the Conference in April, 1960.

APPENDICES

Appendix A

Summary of Revenues and Expenditures 1959-60

	<i>Revenues</i>	<i>Expenditures</i>
ADMINISTRATION SERVICES	\$ 69.00	\$ 818,376.02
Contributions to the Provinces for Camp- ground and Picnic Area Developments		1,894,208.85
Acquisition of Canol Pipeline System		666,345.38
NORTHERN CO-ORDINATION AND RESEARCH CENTRE		94,033.41
NATIONAL PARKS BRANCH		
Branch Administration		193,550.29
National Parks and Historic Sites	1,847,739.87	24,948,024.78
Grant to Jack Miner Migratory Bird Foundation		5,000.00
Grant in aid of the development of the International Peace Garden in Manitoba		15,000.00
National Aviation Museum		44,336.00
National Battlefields Commission		178,290.00
Canadian Wildlife Service	3,555.11	628,986.18
	1,851,294.98	26,013,187.25
WATER RESOURCES BRANCH	121,186.60	2,179,749.60
NORTHERN ADMINISTRATION BRANCH		
Branch Administration	263,500.98	1,513,597.14
Yukon Territory	331,569.82	5,873,864.05
Northwest Territories	3,914,392.92	23,350,632.92
Roads to Resources		8,999,995.70
	4,509,463.72	39,738,089.81
FORESTRY BRANCH		
Branch Administration		160,468.31
Forest Research Division	67,456.97	1,563,104.74
Forestry Operations Division	3,224.04	4,137,236.16
Forest Products Laboratories Division	3,612.10	879,398.67
Grant to Canadian Forestry Association		20,000.00
Eastern Rockies Forest Conservation Board		5,180.89
	74,293.11	6,765,388.77
NATIONAL MUSEUM OF CANADA	1,437.72	642,258.38
CANADIAN GOVERNMENT TRAVEL BUREAU	3,553.50	2,299,938.68
TOTALS FOR DEPARTMENT	\$6,561,298.63	\$81,111,576.15

Appendix B

1. Mineral Production

	1958		1959	
	Quantity	Value	Quantity	Value
NORTHWEST TERRITORIES				
		\$		\$
Gold.....	343,838 oz.	11,683,615	399,176 oz.	13,400,338
Silver.....	72,779 oz.	63,179	69,786 oz.	61,265
Copper.....	868,403 lbs.	220,748	875,000 lbs.	259,000
Nickel.....	3,866,479 lbs.	2,648,538	3,330,000 lbs.	2,331,000
Uranium.....	910,843 lbs.	9,572,847	845,403 lbs.	7,563,964
Petroleum.....	457,086 bbls.	698,266	420,000 bbls.	630,000
Natural Gas.....	24,100 M cu. ft.	8,197	62,500 M cu. ft.	21,250
TOTAL.....	—	24,895,390		24,266,817
YUKON TERRITORY				
		\$		\$
Gold.....	67,745 oz.	2,301,975	68,396 oz.	2,296,054
Silver.....	6,415,560 oz.	5,569,348	6,901,461 oz.	6,058,793
Lead.....	21,566,194 lbs.	2,449,920	21,940,108 lbs.	2,327,845
Zinc.....	15,522,159 lbs.	1,688,811	12,339,920 lbs.	1,510,406
Cadmium.....	160,739 lbs.	244,323	140,000 lbs.	179,200
Coal.....	4,344 tons	56,379	3,284 tons	49,260
TOTAL.....		12,310,756		12,421,558

2. Timber Permits Issued and Volume of Timber Cut

Type of Permit	YUKON TERRITORY					NORTHWEST TERRITORIES ¹				
	Per- mits Issued	Lumber (ft. b.m.)	Round Timber (lin. ft.)	Fuel- wood (Cords)	Ties	Per- mits Issued	Lumber (ft. b.m.)	Round Timber (lin. ft.)	Fuel- wood (Cords)	
Commercial Per- mits.....	35	4,786,592	1,004,189	1,433	4,500	7	15,242,954	225,700	1,278	
Free of fees and dues.....	14	—	19,340	155	—	8	—	8,000	505	
Free of dues.....	10	—	—	530	—	9	—	—	905	
Dues paid.....	217	18,000	143,826	3,300	3,300	126	50,220	70,179	2,112	
TOTAL.....	276	4,804,592	1,167,355	5,418	7,800	150	15,293,174	303,879	4,800	

¹Includes Wood Buffalo National Park.

3. Revenue

	Northwest Territories	Yukon	Provinces	Totals
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Mining.....	233,070.40	97,381.66	—	330,452.06
Oil and Gas.....	2,986,104.62	39,878.18	176,893.61	3,203,876.41
Lands and Timber.....	149,447.72	73,268.68	56,038.53	278,754.93
TOTALS.....	3,368,622.74	210,528.52	232,932.14	3,813,083.40

4. School Enrolment—Northwest Territories

(Including schools operated by the Department of Northern Affairs and National Resources in Northern Quebec and the Yukon Territory)

School	Type of School	Number of Teachers	Enrolment by status as of March 31, 1960			
			Eskimo	Indian	Others	Total
MACKENZIE EDUCATION DISTRICT						
Aklavik.....	FDS	7	64	29	83	176
Aklavik R. C. Hospital School.....	HS	1	6	7	0	13
Aklavik Anglican Hospital School...	HS	1	10	6	1	17
Arctic Red River.....	FDS	1	0	16	0	16
Cambridge Bay.....	FDS	3	42	0	0	42
Coppermine.....	FDS	2	29	0	4	33
Discovery.....	CS	1	0	0	15	15
Fort Franklin.....	FDS	2	0	44	0	44
Fort Good Hope.....	FDS	2	0	35	17	52
Fort Liard.....	FDS	1	0	27	7	34
Fort McPherson.....	FDS	7	0	113	26	139
Fort Norman.....	FDS	2	0	21	26	47
Fort Providence R. C. Residential School.....	RCRS	5	0	88	12	100
Fort Resolution.....	FDS	5	0	26	106	132
Fort Simpson.....	FDS	4	0	43	38	81
Fort Smith.....	FDS	24	0	228	332	560
Fort Smith Hosp. School.....	HS	1	3	21	12	36
Fort Wrigley.....	FDS	1	0	26	0	26
Hay River.....	FDS	13	0	32	259	291
Inuvik.....	FDS	35	270	132	170	572
Jean Marie River.....	FDS	1	0	17	0	17
Lac la Martre.....	FDS	1	0	37	0	37
Norman Wells.....	CS	1	0	0	12	12
*Old Crow, Y.T.....	FDS	2	0	20	6	26
Port Radium.....	CS	1	0	0	9	9
Rae.....	FDS	3	0	65	13	78
Reindeer Station.....	FDS	1	16	0	1	17
Sir John Franklin (Yellowknife).....	FDS	12	21	37	88	146
Spence Bay.....	FDS	1	23	0	0	23
Tuktoyaktuk.....	FDS	4	70	0	6	76
Yellowknife P.S.....	SD	17	0	0	343	343
Yellowknife S. S.....	SD	8	0	30	154	184
Totals for Mackenzie District...		170	554	1,100	1,740	3,394

4. School Enrolment—Northwest Territories—Continued

School	Type of School	Number of Teachers	Enrolment by status as of March 31, 1960			
			Eskimo	Indian	Others	Total
ARCTIC EDUCATION DISTRICT						
Arctic Bay.....	FDS	1	21	0	0	21
Baker Lake.....	FDS	3	60	0	2	62
Broughton Island.....	FDS	1	23	0	0	23
Cape Dorset.....	FDS	1	42	0	0	42
Chesterfield Inlet.....	FDS	4	103	0	5	108
Coral Harbour.....	FDS	2	31	0	1	32
Eskimo Point.....	FDS	2	26	0	0	26
*Fort Chimo, P.Q.....	FDS	2	49	0	1	50
Frobisher Bay.....	FDS	10	175	0	35	210
*Great Whale River, P.Q.....	FDS	6	81	29	4	114
Pangnirtung.....	FDS	1	26	0	0	26
*Port Harrison, P.Q.....	FDS	1	33	0	5	38
*Povungnituk, P.Q.....	FDS	2	68	0	1	69
Rankin Inlet (includes KRP).....	FDS	5	119	0	4	123
Resolute Bay.....	FDS	1	25	0	0	25
*Sugluk, P.Q.....	FDS	1	53	0	0	53
Totals for Arctic Education District.....		43	935	29	58	1,022
Grand Totals for Both Districts		213	1,489	1,129	1,798	4,416

Key

FDS—Federal Day School.

HS—Hospital school.

CS—Company (Mine) school.

RCRS—Roman Catholic Residential School.

SD—Municipal School District.

*—Schools located outside the Northwest Territories.

5. Hostel Enrolment

(Including the Roman Catholic Mission Residential School at Fort Providence)

(Figures as per quarterly returns for the quarter ending March 31)

Name of Hostel	Eskimo			Indian			Others			Grand Totals		
	A	VT	T	A	VT	T	A	VT	T	A	VT	T
MACKENZIE EDUCATION DISTRICT												
Inuvik Anglican.....	171	0	171	37	0	37	28	0	28	236	0	236
Inuvik R.C.....	56	0	56	93	0	93	65	0	65	214	0	214
Sub Totals.....	227	0	227	130	0	130	93	0	93	450	0	450
Fort McPherson.....	0	0	0	74	0	74	5	0	5	79	0	79
Fort Smith.....	0	0	0	174	0	174	25	0	25	199	0	199
Akaiicho Hall.....	7	32	39	5	37	42	25	15	40	37	84	121
Fort Providence RCRS.....	0	0	0	77	0	77	2	0	2	79	0	79
Totals Mackenzie Education District.....	234	32	266	460	37	497	150	15	165	844	84	928
ARCTIC EDUCATION DISTRICT												
Chesterfield Inlet.....	81	0	81	0	0	0	0	0	0	81	0	81
Grand Totals.....	315	32	347	460	37	497	150	15	165	925	84	1,009

Key

A—Academic.

VT—Vocational Trainees.

T—Total.

RCRS—Roman Catholic Residential School.

Appendix C

1. Location, Area and Comparative Statements of Visitors to the National Parks,
April 1, 1959 to March 31, 1960

	Province	Area	1959-60	1958-59	Increase or Decrease
NATIONAL PARKS					
Banff.....	Alta.	2,564 sq. mi.	980,069	880,150	+ 99,919
Cape Breton Highlands....	N.S.	367 "	193,684	162,938	+ 30,746
Elk Island.....	Alta.	75 "	196,862	222,695	- 25,833
Fundy.....	N.B.	79.5 "	199,777	179,277	+ 20,500
Georgian Bay Islands.....	Ont.	5.4 "	17,630	14,521	+ 3,109
Glacier.....	B.C.	521 "	347	386	- 39
Jasper.....	Alta.	4,200 "	324,857	332,251	- 7,394
Kootenay.....	B.C.	543 "	440,031	385,736	+ 54,295
Mount Revelstoke.....	B.C.	100 "	16,089	27,669	- 11,580
Point Pelee.....	Ont.	6 "	745,528	604,149	+141,379
Prince Albert.....	Sask.	1,496 "	136,818	135,546	+ 1,272
Prince Edward Island.....	P.E.I.	7 "	224,781	206,245	+ 18,536
Riding Mountain.....	Man.	1,148 "	659,995	667,561	- 7,566
St. Lawrence Islands.....	Ont.	.27 (172 acres)	53,745	53,573	+ 172
Waterton Lakes.....	Alta.	203 sq. mi.	340,220	362,829	- 22,609
Yoho.....	B.C.	507 "	70,001	51,817	+ 18,184
SUB-TOTAL.....		11,822.17 "	4,600,434	4,287,343	+313,091
NATIONAL HISTORIC PARKS					
Alexander Graham Bell Museum.....	N.S.	14 acres	47,122	45,804	+ 1,318
Batoche Rectory.....	Sask.	1.25 "	936	600	+ 336
Cartier-Brebeuf.....	P.Q.	5 "	10,365	10,200	+ 165
Fort Anne.....	N.S.	31 "	31,159	30,443	+ 716
Fort Battleford.....	Sask.	37 "	15,499	18,099	- 2,600
Fort Beausejour.....	N.B.	81 "	21,369	16,051	+ 5,318
Fort Chambly.....	P.Q.	2.5 "	67,438	56,804	+ 10,634
Fort Langley.....	B.C.	9 "	45,870	55,010	- 9,140
Fort Lennox.....	P.Q.	210 "	9,865	10,816	- 951
Fortress of Louisbourg.....	N.S.	399.5 "	21,625	25,796	- 4,171
Fort Malden.....	Ont.	8 "	32,132	28,855	+ 3,277
Fort Wellington.....	Ont.	8.5 "	28,732	18,859	+ 9,873
Grand Pré.....	N.S.	14 "	38,981	38,945	+ 36
Halifax Citadel.....	N.S.	37 "	190,383	137,259*	+ 53,124
Lower Fort Garry.....	Man.	13 "	33,229	15,000	+ 18,229
Port Royal Habitation.....	N.S.	20.5 "	28,071	28,085	- 14
Fort Prince of Wales.....	Man.	50 "	647	425	+ 222
Signal Hill.....	Nfld.	243.37 "	7,130	3,140*	+ 3,990
Sir Wilfrid Laurier's Birthplace	P.Q.	1.5 "	5,993	6,363	- 370
Woodside.....	Ont.	11 "	4,972	2,046	+ 2,926
SUB-TOTAL.....		1,197.12 "	641,518	548,600	+ 92,918
GRAND TOTAL.....			5,241,952	4,835,943	+406,009

*Revised attendance figures.

N.B.—No attendance records available for Wood Buffalo National Park, Alberta—N.W.T. (17,300 sq. mi.), Terra Nova National Park, Newfoundland (156 sq. mi.).

2. Mileage of Park Roads and Trails

National Park	Motor Roads	Secondary Roads	Fire Roads	Trails
Banff.....	216.50	—	148.95	704.75
Cape Breton Highlands.....	57.06	8.67	62.79	21.87
Elk Island.....	18.00	4.00	7.50	46.00
Fundy.....	19.90	—	37.60	3.70
Georgian Bay Islands.....	—	—	10.75	18.40
Glacier.....	—	—	25.75	124.50
Jasper.....	146.50	20.00	104.00	620.55
Kootenay.....	59.40	—	54.80	207.50
Mount Revelstoke.....	18.50	—	—	48.00
Point Pelee.....	11.50	2.00	2.00	1.50
Prince Albert.....	65.70	67.75	—	280.75
Prince Edward Islands.....	19.31	1.56	—	2.00
Riding Mountain.....	75.05	13.56	81.50	15.50
Waterton Lakes.....	42.70	—	18.50	105.00
Yoho.....	41.10	—	45.00	246.00
TOTAL.....	791.22	117.54	599.14	2,446.02

3. Forest Fire Losses in the National Parks

Park	No. of Fires		Area Burned (Acre)		Cost of Suppression	
	1954-58 av.	1959	1954-58 av.	1959	1954-58 av.	1959
Banff.....	5.6	4	14.1	0	421.55	367.00
Jasper.....	6.6	5	5.4	.3	543.50	101.65
Glacier.....	2.6	—	13.3	0	2,597.10	—
Kootenay.....	1.4	2	24.7	0	1,571.30	50.90
Yoho.....	.6	4	178.9	.2	3,630.30	848.30
Revelstoke.....	1.4	—	1.8	0	384.27	—
Waterton Lakes.....	.4	1	0	0	16.66	3.50
Elk Island.....	.2	1	.8	0	2.40	5.50
Prince Albert.....	1.8	0	19.3	0	401.26	—
Riding Mountain.....	4.2	2	592.6	6.5	789.67	244.33
Georgian Bay Islands.....	.4	0	0	0	—	—
St. Lawrence Islands.....	1.6	1	.8	2.0	17.86	31.10
Point Pelee.....	.4	0	.1	0	4.25	—
Fundy.....	.4	1	—	0	1.00	8.00
Prince Edward Island.....	1.0	0	0.4	0	1.20	—
Cape Breton Highlands.....	.6	0	1.6	0	158.40	—
Terra Nova.....	—	0	—	0	—	0
TOTALS.....	29.2	21	853.8	9.0	10,540.72	1,660.28

Causes

Lightning.....	7
Smokers.....	7
Campfires.....	4
Public Works.....	1
Misc. known.....	1
Unknown.....	1

Size classes

A —0- $\frac{1}{2}$ acre...	19
B — $\frac{1}{2}$ -10 acres.....	2
C1—10-100 acres.....	0
C2—100-500 acres.....	0
D —Over 500 acres.....	0

4. Major Construction in Parks

National Park	By National Parks	By Private Enterprise
BANFF.....	Service station in park compound (under construction); two service buildings and new registration kiosks, Tunnel Mountain campground; warden's residence at Bankhead.	111 building permits issued for total construction value of \$842,054.97. Three permits were for construction exceeding \$25,000; an apartment house; commercial building; and addition to Timberline Hotel. Construction completed on apartment house; commercial building; the Sulphur Mountain gondola lift and terminals, Lake Louise sedan lift and terminals; and additions to Bell Plaza Archways Motels; Elite Cafe and Atkin Clinic.
CAPE BRETON.....	New warden's residence, fire equipment building and office building at Cheticamp.	
ELK ISLAND.....	Staff duplex residence at headquarters and gate office and staff residence at North Gate completed by Department of Public Works. Occupied by departmental staff, August 1, 1959.	
JASPER.....	Duplex warden's residence in Jasper townsite.	105 building permits issued for total construction value of \$509,669.92; construction completed on one private residence, business block offices, laundry, service station and motel. Presently under construction 20 private residences; apartment block, hotel, parish hall (Anglican Church) and ski lodge on The Whistlers Mountain.
KOOTENAY.....	Warden's residence at Kootenay Crossing.	
POINT PELEE.....	Refreshment concession building.	
PRINCE ALBERT.....	Four-suite staff quarters; central repair garage in industrial compound.	26 building permits issued for total construction value of \$78,899.00; construction completed on park theatre, liquor store and Northland Motel. Presently under construction, addition to Red Deer Chalet and Idalodge Apartments.
RIDING MOUNTAIN.....	Staff duplex residence at headquarters; central service garage in new industrial compound, partially constructed.	
TERRA NOVA.....	Central service garage in headquarters area (under construction).	
WATERTON LAKES.....	New outdoor swimming pool incorporating administrative quarters and dressing rooms.	
YHO.....	New garage, stores and workshop buildings (under construction); Gateway building at western entrance; electrical generating station and duplex staff residence (erected by Northern Canada Power Commission).	

5. Statement of Large Mammals in Fenced Enclosures in National Parks

	Buffalo	Elk	Moose	Mule Deer	White-Tailed Deer	Total
Banff Park Paddock.....	4	—	—	—	—	4
Elk Island Park Paddock.....	670	350	250	160	110	1,540
Prince Albert Park Paddock.....	11	—	—	—	—	11
Riding Mountain Park Paddock.....	34	—	—	—	—	34
Waterton Lakes Park Paddock.....	23	—	—	—	—	23
	742	350	250	160	110	1,612

6. Reduction of Mammals

National Park	Mammal	Number Killed	Disposal of Meat and Hides
BANFF.....	Elk	300	Meat and hides donated to Indian Affairs Branch and Banff Indian Days Committee.
	Buffalo	14	10 carcasses for departmental work camp, 4 carcasses in cold storage.
ELK ISLAND.....	Buffalo	502	Meat and 75 per cent of hides sold by tender, balance of hides reserved for sale by Department.
	Elk	411	
	Moose	156	Meat and hides donated to Indian Affairs Branch.
	Deer	12	
WATERTON LAKES.....	Elk	201	Meat and hides donated to Indian Affairs Branch; 24 quarters meat for departmental use.
PRINCE ALBERT.....	Elk	105	Meat and hides donated to Indian Affairs Branch.
RIDING MOUNTAIN.....	Elk	319	Meat and hides donated to Indian Affairs Branch.

7. Tablets Unveiled in 1959

The Governor's Cottage, Sorel, Quebec.

8. Members of Historic Sites and Monuments Board

*Rt. Rev. Mgr. A. d'Eschambault, Genthon, Manitoba, (Chairman).

Dr. Walter N. Sage, Vancouver, British Columbia.

Dr. W. Kaye Lamb, Dominion Archivist, Ottawa, Ontario.

Dr. A. G. Bailey, University of New Brunswick, Fredericton, New Brunswick.

Dr. C. B. Fergusson, Halifax, Nova Scotia.

Richmond Mayson, Esq., Prince Albert, Saskatchewan.

Edouard Fiset, Esq., Quebec, Quebec.

Jules Bazin, Esq., Montreal, Quebec.

O. L. Vardy, Esq., St. John's, Newfoundland.

Dr. D. G. Creighton, University of Toronto, Toronto, Ontario.

Dr. A. R. M. Lower, Queen's University, Kingston, Ontario.

R. Earl Taylor, Esq., Charlottetown, Prince Edward Island.

Richard Y. Secord, Esq., Winterburn, Alberta.

J. D. Herbert, Esq., National Historic Sites Division, Ottawa, Ontario, (Secretary).

*(deceased May 18, 1960)

9. Banding of Wild Birds

Species	Number
Banded in 1959	
Ducks (including Coots)	35,188
Geese	4,124
Trumpeter Swans	4
Colony nesting water birds	23,754
Other migratory birds	68,759
Total	131,829
Banded to date	1,450,732
Banded birds recovered to date	179,351
(This total includes birds banded in Canada and recovered in Canada or elsewhere; also records of birds banded elsewhere than in Canada and recovered in this country.)	

**10. Licences and Permits Issued Under the
Migratory Birds Convention Act**

Nature of Permit or Licence	Number Issued
To collect birds for scientific purposes	412
To take migratory birds for propagation	15
To possess migratory birds for propagation	679
For bird-banding	250
For taxidermy	67
Total	1,423

Appendix D

1. Annual Forest Depletion ¹

	Millions of Cu. Ft. of Usable Wood		Percentage of Depletion	
	1948-57	1958 ²	1948-57	1958
Products utilized:				
Logs and bolts.....	1,473	1,776 ³	43.0	47.8
Pulpwood.....	1,259	944	36.8	25.4
Fuelwood.....	358	272	10.5	7.3
Other products.....	74	57	2.1	1.5
TOTAL.....	3,164	3,049	92.4	82.0
Wastage:				
By forest fires.....	260	669	7.6	18.0
GRAND TOTAL.....	3,424	3,718	100.0	100.0

¹Does not include wastage caused by agencies other than fire, such as insects, diseases, and natural mortality for which no reliable estimates are available.

²Preliminary estimates.

³Including logs for pulping.

2. Forest Industries

SUMMARY OF PRINCIPAL STATISTICS, 1957

	Number of Employees	Salaries and Wages	Net Value of Production ¹	Gross Value of Production
		\$	\$	\$
Woods operations.....	119,944 ²	430,804,865	733,112,661	823,054,498
Pulp and paper industry.....	65,940	307,627,849	693,475,562	1,419,288,324
Lumber industry.....	50,664	143,166,269	237,700,416	555,688,385
Wood-using industries.....	76,175	225,493,899	348,083,054	780,328,476
Paper-using industries.....	28,343	95,658,442	184,509,995	455,194,588
TOTAL.....	341,066	1,202,751,324	2,196,881,688	—

¹Net value of production is gross or sale value, less cost of materials, fuel, purchased electricity, and process supplies consumed.

²Man-year basis (300 working days)

3. Forest Fire Losses in Canada, 1958
(COMPARED WITH 10-YEAR AVERAGE 1948-57)

	Provinces		Yukon and NWT	
	Annual Average 1948-57	1958	Annual Average 1948-57	1958
Total number of fires.....	5,293	7,650	106	167
Total area burned (acres).....	1,516,920	3,300,185	595,299	1,639,695
Size of average fire (acres).....	287	431	5,616	9,819
Saw timber burned (M ft. b.m.).....	397,171	2,299,762	12,069	1,500
Small material (cords).....	1,893,565	1,633,028	178,204	827,927
Actual cost of fire fighting.....\$	2,908,607	\$ 7,526,357	\$ 50,768	\$221,153
Other fire protection costs.....	\$15,657,567	\$ 22,971,054*	\$134,465	\$387,642
Area under protection (sq. mi.).....	—	1,211,954	—	125,000

*This figure is based on 1957 data for capital, maintenance, and other expenditures.

4. Reforestation under the Forestry Agreements

Province	Number of Trees Planted		Area Planted (Acres)		Area Seeded (Acres)	
	Fiscal Year 1959-60	Total to Date	Fiscal Year 1959-60	Total to Date	Fiscal Year 1959-60	Total to Date
Prince Edward Is.....	25,000	403,000	20	326	—	
Nova Scotia.....	—	915,000	—	1,087	—	
Ontario.....	13,435,000	82,295,000	13,435	82,295	—	6,000
Manitoba.....	1,002,000	5,973,000	1,114	5,417	—	
Saskatchewan.....	—	1,625,000	—	1,353	—	1,636
British Columbia.....	1,318,000	14,422,000	2,324	17,922	—	
TOTALS.....	15,780,000	105,633,000	16,893	108,400	—	7,636

5. Payments to Provinces Under the Inventory and Reforestation Agreements and Trails Agreements

Province	Forest Inventory		Reforestation		Total Federal Payments	
	Fiscal Year 1959-60	Total to Date	Fiscal Year 1959-60	Total to Date	Fiscal Year 1959-60	Total to Date
	\$	\$	\$	\$	\$	\$
Prince Edward Island..	—	—	25,125	128,045	25,125	128,045
Nova Scotia.....	8,372	332,092	1,319	13,015	9,691	345,107
New Brunswick.....	16,341	154,845	—	—	16,341	154,845
Ontario.....	182,526	2,134,737	181,853	931,394	364,379	3,066,131
Manitoba.....	21,299	370,254	10,016	71,981	31,315	442,235
Saskatchewan.....	43,930	315,225	—	16,617	43,930	331,842
Alberta.....	60,008	709,867	—	—	60,008	709,867
British Columbia.....	407,708	3,768,022	13,180	161,911	420,888	3,929,933
TOTALS.....	740,184	7,785,042	231,493	1,322,963	971,677	9,108,005

6. Payments to Provinces Under the Forest Fire Protection and Access Roads Agreements

Province	Forest Fire Protection		Access Roads and Trails	
	Fiscal Year 1959-60	Total to Date	Fiscal Year 1959-60	Total to Date
	\$	\$	\$	\$
Newfoundland.....	67,798	156,452	7,936	7,936
Prince Edward Island.....	4,416	8,184	—	—
Nova Scotia.....	65,076	121,417	33,504	45,187
New Brunswick.....	67,834	157,061	4,061	19,850
Ontario.....	342,627	715,934	545,328	1,055,475
Manitoba.....	80,239	172,128	99,153	220,535
Saskatchewan.....	103,946	222,368	161,353	252,579
Alberta.....	187,028	343,697	104,322	167,678
British Columbia.....	310,620	582,343	640,180	835,194
TOTALS.....	1,229,584	2,479,584	1,595,837	2,604,434*

*Total including previous agreements, \$4,294,170.

Appendix E

Natural History Branch and Human History Branch

Wednesday Evening Adult English Lectures

- "The Races of Man"—Carleton S. Coon, Ph.D., University of Pennsylvania.
- "Hawk Mountain"—Maurice Broun, Hawk Mountain Sanctuary, Kempton, Pa.
- "Old Customs in a New Land"—John T. Sanford, Ph.D., Wayne State University.
- "Exploring the Ocean's Floor"—Arthur H. Clarke, Jr., National Museum of Canada.
- "The Races of Uganda"—Lawrence Oschinsky, Ph.D., National Museum of Canada.
- "Fundy Shores"—Esther Clark Wright, Ph.D., author, Ottawa.
- "Songs from Quebec"—Jacques LaBrecque, folksinger, Montreal, P.Q.
- "Turkey—Yesterday's Tomorrow"—Neil Douglas, explorer-lecturer, Meriden, Conn.
- "Impressions of Northern Europe, 1959"—A. W. F. Banfield, Ph.D., National Museum of Canada.
- "Crawley Presents"—Judith Crawley, Crawley Films, Ottawa.
- "Seas of the North"—M. J. Dunbar, Ph.D., McGill University.
- "Sea Lampreys—Menace to Great Lakes Fisheries"—V. D. Vladykov, Ph.D., University of Ottawa.
- "Molecules and Living Things"—Keith J. Laidler, Ph.D., D.Sc., University of Ottawa.
- "Israel—a Nation Reborn"—Raanan Sivan, Embassy of Israel, Ottawa.
- Ghana Celebrates her Third Birthday—Philip Stuchen, Dept. of Trade and Commerce, Ottawa.
- Diamonds in Africa—M. Tremblay, Ph.D., Geological Survey of Canada.
- Zuni—a Conservative Pueblo—J. M. Roberts, Ph.D., Cornell University.
- Canada's Early Eskimos—Moreau S. Maxwell, Ph.D., Michigan State University.
- Arctic Neighbors—R. A. J. Phillips, Dept. of Northern Affairs and National Resources, Ottawa.

Special Adult English Lectures

- Expedition to Chamba-Lahul—Illustrated lecture on mountain climbing by Frank Solari (in co-operation with the Alpine Club of Canada).
- Darwin's Century—Rev. F. E. Banim, O.M.I., St. Patrick's College, Ottawa.
- Vagabonds of the Mountains—Hans Gmoser, mountain climber and guide.
- The Comparison of the Circumpolar Cultures with that of our own Civilization—John J. Honigman, Ph.D., University of North Carolina.

Adult French Lectures

- Combat culturel au Québec—Paul Gouin, Docteur-es-lettres, conseiller technique près le Conseil Exécutif de la province de Québec.
- Famille et parents dans les villes Canadiennes-Françaises—M. le professeur Philippe Garigue, Université de Montréal.

Saturday Morning Children's Programs

- Films on the Far East and Pacific area, presented in co-operation with the Royal Commonwealth Society.
- Mr. Scoutmaster—feature film.
- Puppet show, with films "Prehistoric Animals" and "Life on the Seashore".
- "The Living Desert"—Walt Disney film.
- Films on South Africa, presented in co-operation with the Royal Commonwealth Society.
- Films and talk on Geology, by H. F. Thompson, National Museum of Canada.
- "Woodland Indians"—film, with talk by H. Pfeiffer, National Museum of Canada.
- "Nature's Secrets of Life"—Walt Disney film.

Films on Australia, presented in co-operation with the Royal Commonwealth Society.

Film program on birds.

"R.C.M.P. File 1365" and "Hunting Animals of the Past", two films.

"Escapade in Japan"—feature film.

"Oliver Twist"—feature film.

"Where Mountains Float"—film on Greenland, with talk by H. Pfeiffer, National Museum of Canada.

Films on Switzerland.

Films on New Zealand and India, presented in co-operation with the Royal Commonwealth Society.

"Treasure Island"—feature film.

Two films on the Royal Canadian Mounted Police, with a talk on dog training by Cpl. Chettleborough, R.C.M.P.

Film program on the United States of America.

Films on Ceylon and Pakistan, presented in co-operation with the Royal Commonwealth Society.

"Kon-Tiki"—feature film.

"Diamonds in Africa"—talk with films by M. Tremblay, Ph.D., Geological Survey of Canada.

Films on the Union of South Africa, introduced by W. F. Van Eyssen, Information Adviser, Union of South Africa.

Appendix F

LIST OF TECHNICAL PUBLICATIONS ISSUED 1959-60

National Parks Branch

Translations of Russian Game Reports

Volume 6 (Trapping and the Fur Industry, 1951-55), 1959.

Wildlife Management Bulletin

Series 1, Number 14. Preliminary Investigations of the Atlantic Walrus, A. G. Loughrey, 1959.

Technical Articles

- The Fisher in Nova Scotia, D. A. Benson, J. Mamm. 40(3):451, 1959.
- Mineral Analysis of Livers and Kidneys of Moose, D. A. Benson (collaboration) J. Wildl. Mgmt. 23:356-368, 1959.
- Machias Seal Island Sanctuary, B.C. Carter, Can. Audubon 21:36-39, 1959.
- Growth and Plumage Development of Wild-trapped Juvenile Canvasbacks, A. Dzubin, J. Wildl. Mgmt. 23:279-290, 1959.
- Moose Using Water as Refuge from Flies, D.R. Flook, J. Mamm. 40:455, 1959.
- The Horns and Teeth as Indicators of Age in Bison, W. A. Fuller, J. Wildl. Mgmt. 23:342-344, 1959.
- Record of *Wyominia tetoni* Scott, 1941 from *Ovis dalli* in the Yukon Territory, W. A. Fuller and H. C. Gibbs, Can. Jour. Zoology, 37, 1959.
- A Poisonous Fungus in the Northwest Territories, J. P. Kelsall, Can. Field-Nat. 73:130, 1959.
- The Breeding Biology of the Greater Snow Goose on Bylot Island, Northwest Territories, L. Lemieux, Can. Field-Nat. 73:117-128, 1959.
- The Migration, Mortality Rate and Recovery Rate of the Quebec Black Duck, L. Lemieux and G. Moisan, Trans. 10th Northeast Wildl. Conf. 1958: pp. 124-133, 1959.
- Histoire Naturelle et Amenagement de la Grande Oie Blanche, L. Lemieux, Nat. Can. 86:133-192, 1959.
- Notes on the Birds of Southern Foxe Peninsula, Baffin Island, N.W.T., A. H. Macpherson (collaboration) Can. Field-Nat. 73:63-81, 1959.
- The Birds and Mammals of Adelaide Peninsula, N.W.T., A. H. Macpherson (collaboration) Nat. Mus. Canada, Bull. 161: 67 pp., 1959.
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ARCTIC OCEAN



DEPARTMENT OF
NORTHERN AFFAIRS & NATIONAL RESOURCES

MAP SHOWING
CENTRES OF ACTIVITY

Scale of Miles
0 100 200 300

LEGEND

- Water Resources Office
 Forestry Office
 Wildlife Office
 Wildlife Warden Post
 R.C.M.P. Office Where Agent for
 Northern Administration
 Branch
 Engineering Office
 Northern Administration Office
 Road Serving The Territories
 Road Under Construction
 Rehabilitation Centre
 Game Reserve
 National Park
 Historic Park
 Jointly Operated Area
 N.A. & B.C. & M.P.
 School
 Students Residence
 Power Station (N.C.P.C.)
 Eastern Rocket Test
 Conservation Area
 Canadian Government Travel
 Bureau
 National Parks

NATIONAL PARKS

- 1 Terra Nova
- 2 Cape Breton Highlands
- 3 Pelly-Edmonton Island
- 4 Fundy
- 5 St. Lawrence Islands
- 6 Point Pelee
- 7 Georgian Bay Islands
- 8 Riding Mountain
- 9 Prince Albert
- 10 Elk Island
- 11 Jasper
- 12 Banff
- 13 Watkins Lakes
- 14 Yoho
- 15 Kootenay
- 16 Glacier
- 17 Mount Roubidoux
- 18 Wood Buffalo

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Department of Northern Affairs and National Resources

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Annual Report

FISCAL YEAR 1960-1961



... and a special article "A MUSEUM FOR CANADIANS"



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*To His Excellency Major General Georges P. Vanier, D.S.O., M.C.,
C.D., Governor General and Commander-in-Chief of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

The undersigned has the honour to lay before Your Excellency the Annual Report of the Department of Northern Affairs and National Resources for the fiscal year ended March 31, 1961.

Respectfully submitted,

WALTER DINSDALE
*Minister of Northern Affairs and
National Resources*

*The Honourable Walter Dinsdale, P.C., M.P.,
Minister of Northern Affairs and
National Resources.*

Sir:

I have the honour to submit the Eighth Annual Report of the Department of Northern Affairs and National Resources, for the fiscal year which ended on March 31, 1961.

The progress of development in the Canadian North was reflected in many ways. The value of production of gold, silver, copper and nickel was higher than last year and activity was maintained in the search for oil and gas. Permits covering nearly 40 million acres in the Arctic Islands and 4,000 acres on the continental shelf were issued during the year and some \$20 million were spent by private enterprise on exploratory work. Road construction and improvement made big strides, and began to show dividends in encouraging both resource development and the tourist industry. Schools were built and expanded as part of the program to provide, by 1968, education for all of the children living in the Northwest Territories. More than half of the Eskimo children of school age are now being taught and they represent almost 40 per cent of the five thousand pupils now at school.

Extensive studies were prepared by the Water Resources Branch for use in the negotiations for the development and control of the Columbia River. Special studies were also continued to determine the power potential of the Mackenzie River and of the upper part of the Yukon River and its tributaries. The Branch reports that installed water-power capacity was increased by nearly one and three-quarter million horse-power, and the total installed capacity now represents nearly 40 per cent of the current estimate of Canadian water-power resources.

Nearly five million people visited the National Parks during the 1960-61 season to register another record for attendance. Banff National Park contributed more than 20 per cent of this total and substantial increases were reported from national parks in the Maritime Provinces. The growing popularity of camping was reflected in a 13 per cent increase in the use of national park campgrounds.

Development of Terra Nova National Park in Newfoundland continued as planned, to permit the official opening of the park in the summer of 1961. Good progress was made in the improvement of parks highways, notably in the reconstruction of the Banff-Jasper and Banff-Windermere Highways and the paving of the Cabot Trail. Restoration work on structures of national historic importance involved the Promenade des Gouverneurs at Quebec, the Old Town Clock at Halifax, Fort Prince of Wales, Cabot Tower, Signal Hill, and Port Royal Habitation.

Towards the end of the year the National Museum of Canada started to use space in the museum building vacated by other departments. Work is now proceeding toward the establishment of larger-scale permanent exhibits in the new halls. Field investigations were continued in most parts of Canada and the scientific staff of the museum was strengthened. Many additions were made to the national collections by field work and by public donation, and small collections were sent out on loan.

The special article introducing this year's report deals with the growth and purpose of the National Museum of Canada.

The importance of tourism to the national economy was demonstrated last year when statistics showed the tourist industry second only to newsprint among the country's leading earners of foreign exchange. Interest in Canada as a place to visit was maintained, and more than three-quarters of a million inquiries were handled by the Canadian Government Travel Bureau.

The Federal-Provincial "Roads to Resources" Program became a completely national effort with the signing of an agreement with the Province of Quebec midway through the year. More than \$86 million was approved for work carried out by the provinces, half of which represented the Federal Government's share. The department was also concerned with two other co-operative programs, one to assist in the development of campgrounds and picnic grounds along the Trans-Canada Highway and the second to provide campgrounds and picnic areas in other parts of Canada and encourage employment during the winter months. Eight provinces took advantage of the latter offer and about 5,500 man-months of employment was provided.

The tempo of public interest in the "Resources for Tomorrow" Conference was reflected in frequent references to plans and preparations for the meeting in the press, on radio and television and from public platforms. Information bulletins and a booklet setting forth the objects and scope of the Conference were issued during the year and good progress was made on the English and French editions of the two volumes of Conference background papers.

The research program of the Northern Co-ordination and Research Centre continued to expand. Plans were prepared for a research laboratory at Inuvik to serve government scientists and other research workers.

The Annual Report outlines in some considerable detail the work undertaken and progress achieved in these and the many other aspects of departmental responsibility. As in past years, the department has called on other government services for assistance. I would like to mention particularly the Treasury Office and the Translation Office, as well as the departments whose responsibilities extend into northern Canada. Their support, freely extended, has been of the greatest importance in helping us to carry out government policies in fields assigned to this department.

Your obedient servant,

R. G. ROBERTSON,
Deputy Minister.

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Inserted at the back of this Report is a map showing the location of national and historic parks; game reserves; highway projects; water resources, wildlife, engineering and Northern Administration offices and posts, and other centres of departmental activity.

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National Museum of Canada

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Mineralogy	S. C. ROBINSON (HON. CURATOR)
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(Invertebrate)	H. W. FREBOLD (HON. CURATOR)
Zoology	A. W. F. BANFIELD
Entomology	G. P. HOLLAND (HON. CURATOR)

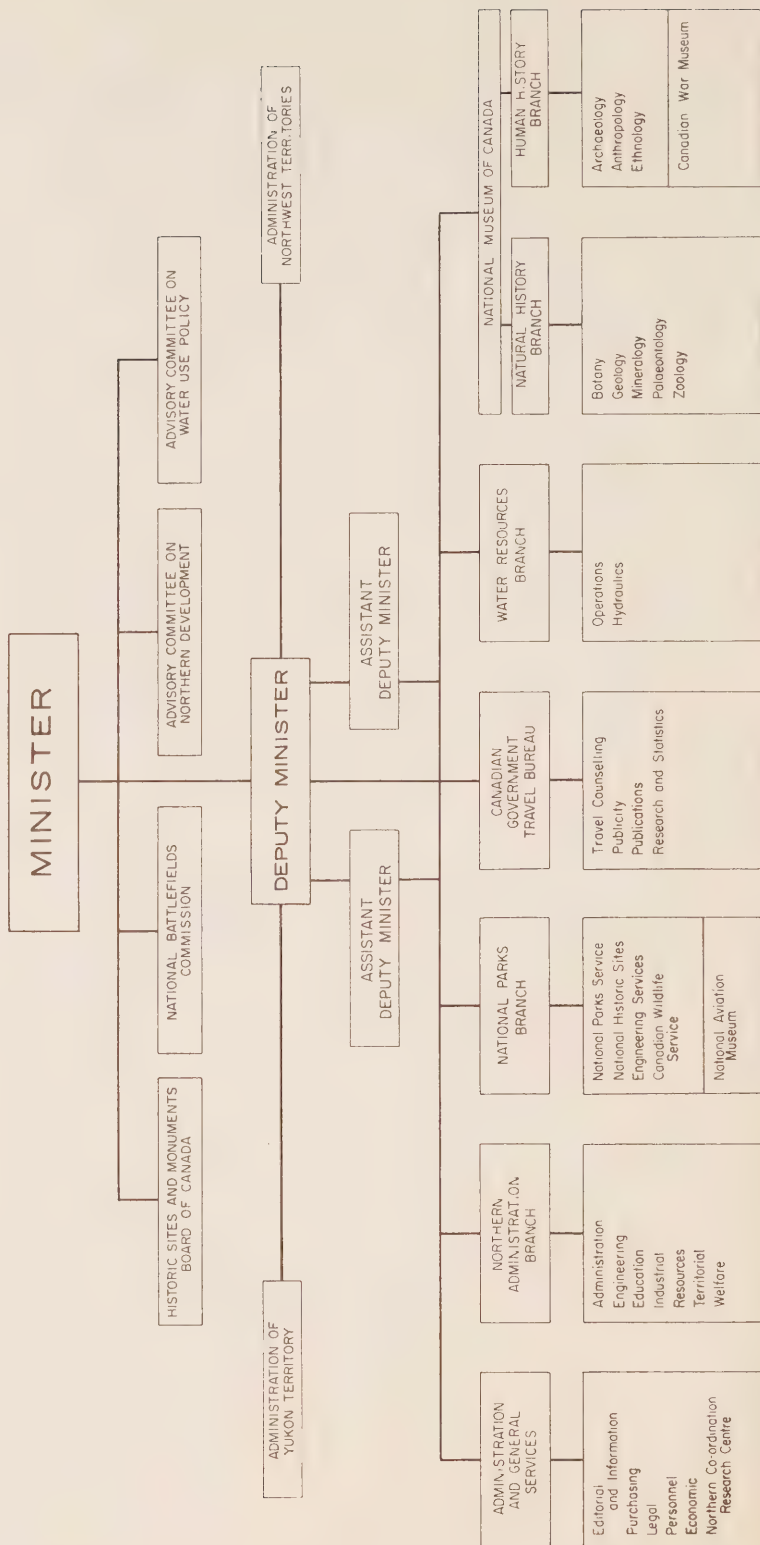
Human History Branch

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Physical Anthropology	LAWRENCE OSCHINSKY
Ethnology	T. F. S. McFEAT
Folklore	CARMEN ROY
Canadian War Museum	L. F. MURRAY

Canadian Government Travel Bureau

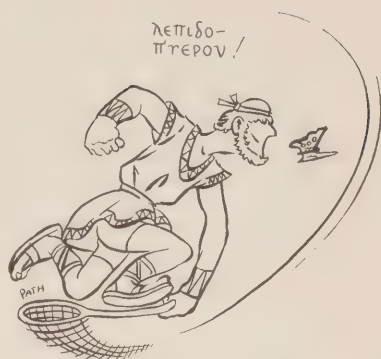
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DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES



A Museum for Canadians

The first museum was a government institution—part of the palace of King Ptolemy in Alexandria which in the 3rd century B.C. housed the library of Alexander the Great. It was called by the Greek term *Museion*—Temple of the Muses—and was the world's chief centre of learning in its day. For in addition to the manuscript library, it housed laboratories and workshops and collections of scientific instruments and natural history objects.



Most of all, however, the Ptolemaic Museum was an assembly of scholars, who used the library, the laboratories, and the objects in the collection for the furtherance of man's knowledge about the universe.

In the centuries that have elapsed since the founding of the Museum of Alexandria, the concepts of what a great museum should be and what it should do have undergone many changes. But today these concepts have swung back towards the ideas of the ancient Greek Pharaoh, that a museum should be an institution, not only for the collection and preservation of objects but also for the study of them and the propagation of the knowledge thus obtained.

How envious those scientists of old would be, if they could visit a modern *museion*—such as our National Museum of Canada—and see the multiple resources it possesses for the study of our world. Yet as the basis of it all they would find the same concept of scholarly research and the dissemination of the knowledge thus obtained. The various methods of dissemination, however, would amaze them—printed books, public lectures, motion picture films and highly organized displays of objects illustrating the world of Man and of nature.

Almost exactly 1,200 years after the Alexandrian Museum was finally destroyed by the Arabs, the National Museum of Canada had its beginnings. In 1842 the Geological Survey of Canada was established in Montreal under the directorship of William Logan. His great contributions to Canadian geology and hence to the mining industry of Canada have been described elsewhere.

But Logan was also a museum man, by both experience and inclination, and he made the gathering of rocks, minerals and fossils for study and display part of his programme from the beginning. He had an eye for interesting and spectacular specimens, and he urged on his assistants the importance of collecting such material. This interest in display culminated in the Canadian

exhibit at the 1851 Exhibition in London, which drew favourable attention in both Great Britain and Canada. Logan's collecting was mainly geological, but his interests extended to botany and zoology and he clearly saw his survey collection as the beginning of a national museum.

Under Logan's successors the museum expanded slowly, but the limitation was of space, not of interest. The field geologists collected not only their rocks and fossils but zoological and botanical specimens as well. G. M. Dawson, a geological pioneer in British Columbia, secured priceless relics of the amazing West Coast Indian culture. Robert Bell, another geologist, brought back specimens of early man's culture from his explorations in northern Canada. Visitors were welcome in the crowded museum and its

expansion was one of the reasons that the Survey headquarters had to be moved several times in Montreal. In 1880 the Geological Survey and its museum were transferred to Ottawa, and housed in the former Clarendon Hotel, at the corner of Sussex and George Streets.

Biology became a full-time activity with the Geological Survey when John Macoun was appointed to the staff in 1882. G. F. Whiteaves, the Survey palaeontologist, was also a zoologist of distinction. Soon the old limestone building was overflowing with stuffed birds, sea shells, and totem poles, as well as minerals and fossils.

Logan's dream of a building fit to house a national museum was revived in 1895 with the proposal to build a "Victoria and Albert Museum" in Ottawa. Actual construction did not start until 1904, by which time the good Queen had passed on, and the building completed in 1911 became known as the Victoria Memorial Museum.

The Geological Survey and its Museum moved into the building in 1910 before it was finished. Tradition has it that other Government agencies were marshalling their arguments to be the custodians of Canada's national collections in the new building, and Dr. R. W. Brock, Director of the Survey, forestalled them by this premature occupation. In any case Dr. Brock had clearly defined the scope and aims of the Museum as the National Museum of Canada to collect and display materials illustrating in the broadest sense the geology, biology and history of man in the country. He recognized the educational role of the Museum and suggested that this might lead it eventually to assemble collections of a world-wide rather than purely Canadian nature. His organization of the Museum staff, as distinct from that of



the Geological Survey, into an Anthropological Division (with Archaeology and Ethnology Sections) and a Biological Division (with Botany and Zoology Sections) remains essentially the arrangement in the National Museum of Canada today.

Brock and his successors assembled a staff of anthropologists and biologists including many distinguished scholars and these men began making important contributions in their sciences, as well as setting up attractive exhibitions of the collections under their care. Technicians in zoology and palaeontology were added to the staff to mount the animals and set up the dinosaur skeletons. The loan service of specimens to schools was expanded and regular series of public lectures for children and for adults were established.

In 1920 the Museum was given a partly separate administration under William McInnes, the first Director. The name "National Museum of Canada" was applied in 1927. In 1950 the Museum was placed in a separate Department (Resources and Development) from that of the Geological Survey. It later became part of the Department of Northern Affairs and National Resources and in 1957 it was divided into two branches, Human History and Natural History, corresponding to the old Divisions of Anthropology and Biology.

The growth of the National Museum has not been steady; in fact there have been many set-backs. In 1915 it was discovered that the walls of the building were sinking into the unstable foundation, but the movement was partially arrested by removing the main tower. On February 3, 1916 the Centre Block of the Parliament Buildings burned, and Parliament took over the Museum building for four years. The depression of the 1930's slowed Museum activities to a crawl and the Second World War almost stopped them.

Resurgence of the Museum dates from 1947 when, under Dr. F. J. Alcock, the Museum, along with the Geological Survey, was host to the Annual Meeting of the Geological Society of America, held in Ottawa to celebrate (belatedly) the centenary of Survey and Museum. For this event various renovations of the building and modernization of the exhibits were authorized, and from that time the development of the Museum has been continuous. Today it is assuming more of the responsibilities of a national museum of the geological, biological, and anthropological sciences.

What then are these responsibilities? To what extent has the National Museum of Canada already met them, and how can it more fully respond to its mandate and its opportunities? For an institution that has had an actual existence of 118 years and a corporate entity of 40 years, the answers to these questions are somewhat overdue.

First and foremost any museum worthy of the name must be a centre of learning. Its province is man and the world around him. It works through assembling and preserving its collections, studying them and making the resulting knowledge available to people. The collections in the care of the

National Museum of Canada illustrate the nature of the Canadian environment, and of man in Canada. More specifically they are concerned with the study of the earth (geology), of life (biology), and of man (anthropology).

Although the primary interest of the National Museum is with things Canadian, these cannot be fully understood if seen only from within Canada. For example, the origins of man in this region cannot be understood until they are traced back by comparison of prehistoric evidence with that of Alaska and Siberia. Again, the origins of some foods on which the early peoples of Canada lived have been found in regions to the south. Museum archaeologists have discovered that the present-day "corn on the cob" has been derived by selective breeding from plants cultivated by Mexican aborigines about 5000 B.C. Study of cave deposits in Mexico have established the early stages and dates in the development of corn, squash, beans, tobacco, and other plants cultivated by the Indians of North America and made available to the early settlers from Europe. This exciting story has been illustrated by a special display in the National Museum.

Another example may be seen in the study of Canadian birds. Many of these, especially the northern ones, are closely related to birds of Europe and Siberia. Frequently migrating birds of other lands stray to the shores of Canada. To understand these aspects of Canadian bird life one must know something of the birds of adjacent regions, and the Museum is building up by exchange a collection of European and Asiatic birds. The National Mineral Collection, shared by the Museum and the Geological Survey, is not restricted to Canadian minerals, because one never knows what varieties, now unknown in this country, may some day be discovered here.

The terms of reference for the National Museum's activities were clearly set out by Dr. Brock in 1910 and in the Department of Northern Affairs and National Resources Act of 1953:

"9. The Minister has the control, management and administration of the National Museum of Canada, and shall collect, classify and arrange for exhibition in the Museum of such specimens as are necessary to afford complete and exact knowledge of the geology, mineralogy, archæology, ethnology and the fauna and flora of Canada."

In more simple terms the Act intends that the Minister shall take the means to collect and make available to the public a storehouse of knowledge about Canada's natural and human history. How is this storehouse of knowledge being filled and how is it being made available to the public? We shall try to answer these questions, in the fields of both natural history and human history.

As indicated earlier, scientists of the Geological Survey gave the first impulse to the Museum. They were systematically mapping the kinds of rocks that underlie the country, and trying to determine their actual or potential mineral resources. From rocks, minerals, and fossils their interests extended

to the plants and animals of the region. Soon trained botanists and zoologists were added to the staff to study the collections and to gather additional material.

As a result of the early start in botany, the collection of plants that makes up the National Herbarium is very large indeed. Few people realize that over 350,000 individual specimens of plants are available for study in the National Herbarium. In this important part of the Museum's work, botanists of the Museum have achieved a world-wide reputation while maintaining one of the finest collections of plants in North America and one of the unique collections of the world. The Herbarium can be looked upon as a tremendously large dictionary of plants, which is at the disposal, not only of Canadians, but of any person seeking information on the plants of Canada.



Moving from the vegetable to the animal kingdom, one finds equally spectacular storehouses of knowledge. The bird collection reflects the pioneer interest and energy of Macoun and Taverner, and the dedicated labour of their successors. Today there are over 44,000 specimens in this collection. To most of us, a bird is something with feathers that flies and sings. To those who take the time to observe the wonders of nature, birds are creatures of infinite variety and a source of real joy. No other group of animals arouses so much popular interest, and "bird-watching" as a hobby is found in all classes and occupations. Birds have a definite roll in the welfare of man, and without them the cycle of the balance of nature would be disrupted and many areas would be over-run with pests. The first step in acquiring a knowledge of birds is to learn to identify them, and the second is to learn something of their habits. For many years the best source of this information on Canadian birds was Taverner's "Birds of Canada", which was based on the collections and research of the National Museum. This is now out of print, but scientists of the National Museum have been working on a new "encyclopædia" of Canadian birds for the past several years. The work is well advanced, and when completed will be an outstanding scientific and popular illustrated reference book of Canada's birds.

However, birds are only a part of the zoological collections. Mammals, reptiles, amphibians, fishes and invertebrates are represented in collections that total over 300,000 specimens which have been catalogued and are available for examination and study. Research in all these groups is being actively supported by the Museum, both through its staff and its associated zoologists.

The Museum is concerned not only with the life of the present, but also with that of the past. Knowledge of this is obtained through the study of fossils, the science of palaeontology. Fossils have a practical importance in geology,

because they permit the identification of the various layers of sedimentary rock, and thus assist in working out the structure of oil reservoirs and coal fields. They also throw light on the history of life in past ages; this is particularly true of the fossils of animals with backbones, such as fishes, reptiles, and mammals. The Museum's collection of such fossils includes relics of fishes from the Atlantic Provinces and mammal bones from Saskatchewan, but the most important part is the great series of dinosaur skeletons from Alberta, which has been collected almost continuously since 1912. This is the largest collection of Canadian dinosaurs and one of the most important dinosaur collections in the world. Because of space limitations, only a small portion of it has ever been displayed.

In human history, man's part is studied partly from the written record (or spoken tradition) and partly from the material traces that he has left on the earth. Aside altogether from any written records, earlier people have left behind evidence of the way they lived: stone tools and weapons, traces of the animals and plants they ate, remnants of the dwellings that they occupied. Man always asks himself: how did he originate? how did he evolve on this planet? Modern methods can establish the age of relics to within a few decades. Archaeologists, who study the material evidence of unwritten history, can fit their discoveries into the time sequence and in so doing throw light on the development of cultures, and the interrelationships and migrations of early people. Thus pottery fragments found in the Canadian prairies by Museum archaeologists have been dated as of about 500 A.D. Similar pottery has been found in sites in the Yukon Territory which date from before the birth of Christ. The same type of pottery again appears in Siberia, tentatively dated at about 2000 B.C. This sequence seems to show the gradual movement of peoples, or at least the flow of cultures, through the Bering Straits region and the Yukon into what is now central Canada.



Collecting by Museum archaeologists was begun in Ontario, and as a result there is a large amount of material concerning the early Iroquois, Hurons, Algonkians, and their predecessors, available at the Museum. Among the relics of ancient Eskimos are the artifacts discovered by Diamond Jenness, from which he established the former existence of the Cape Dorset culture. There is representative material from the Atlantic Provinces and from the coastal areas of British Columbia. In recent years some very productive work has been done in various

parts of Yukon Territory, in the areas through which we now believe the early immigrants to North America passed.

The material evidence of early man can only be understood in the light of existing races and cultures. Thus archaeology merges into history and ethnology (the study of present peoples and cultures). In the field of Canadian ethnology the National Museum has been a pioneer. Collections illustrating the arts and crafts of the coastal tribes of British Columbia were begun by the geologist G. M. Dawson in 1879. After the Museum acquired a staff of professional ethnologists the West Coast collection was greatly expanded. More recently the superb private collection of Lord Bossum of Maidstone was purchased, with the result that the National Museum's combined collection representing the West Coast Indian culture is among the finest in the world.

The unique way of life of the Plains Indians is also represented by some exceptionally fine material, much of it having historical as well as ethnological interest. For example, it includes a shield with a known history of nearly 200 years, and such personal items as the moccasins of Sitting Bull and of Poundmaker. The Museum's collection of native water-craft represents almost every type found in Canada; among these are a Haida sea-going war canoe, a Kootenay canoe with its unique bow and stern construction, graceful examples of the Algonkian birch-bark canoes, the grotesque elm-bark canoe of the Iroquois, various styles of the Eskimo kayak, and an umiak or sealskin whale boat of recent but authentic construction. There is also a full-sized reproduction of the old-time fur brigade freight canoe.

The material culture of the Canadian Eskimo is unevenly represented in the Museum's collection, but there is a magnificent series of objects from the Copper Eskimos, collected many years ago in the Coronation Gulf region. Most other parts of the Canadian Arctic were visited too late by Museum collectors to get authentic pre-European or early material, but recent work in the Pelly Bay area of northern Keewatin has brought together a series of utensils and objects with surprisingly little influence from the white man's culture. The recent development of Eskimo carving in the eastern Arctic has aroused wide interest. The national collection of Eskimo sculpture has been placed in the care of the National Museum, as it is an outgrowth of the artistic folk tradition already represented there. In addition to many fine pieces depicting the Eskimo's view of himself and the animals that he hunts,



the Museum's collection includes a series of vigorous sculptures specially carved to illustrate Eskimo legends and folk-tales.

So much for the unwritten, material evidence relating to the aboriginal peoples of Canada. What has been done to bring together the material evidence of the development of the European peoples in this country?

Folklore and folk-music make up another field in which the National Museum has made a major contribution to the preservation of the Canadian heritage. Folklore—tales of the people—were mostly collected by word of mouth. The songs of the past were also collected largely from people who had learned them from their mothers or fathers. By careful annotation they could be transcribed and then compared with versions still known to exist, say, in France, or in books. As early as 1911, Museum ethnologists began using the Edison phonograph with its wax cylinders to record songs and tales of the present and past. The name of Marius Barbeau stands out as one of Canada's great collectors of folklore and folk-songs. The modern tape recorder has made it possible to preserve with great fidelity the songs and tales of those who still retain the oral traditions. Meanwhile the older recordings on cylinders and discs are being transcribed to tape, to ensure greater permanence and accessibility. The Museum has a wealth of recordings from aboriginal peoples and from those of French, English, Irish or Scottish extraction. Much of this has been published, and some of it has served as source material for well known musical compositions of truly Canadian inspiration.

As has been said, archaeology, ethnology, and history intermerge. Thus, although without a definite programme in history until recently, the National Museum has over the years acquired much historical material, either because opportunities have arisen to obtain items that might otherwise be lost, or because staff members were making special studies. For example, the golden age of French-Canadian wood-working is represented by fine series of religious carvings and household furniture. An organized effort is now being made to have all of the folk arts and crafts represented in the collection, and to acquire material illustrating the development of the Canadian way of life from pioneer times. This collection will be the nucleus of a museum of Canadian history.

Material evidence is the main concern of a museum. But the Museum has also made some significant contributions in assessing the social development of Canadians. In this field of social anthropology there have been some fascinating studies made in recent years, mostly dealing with the Canadians of European origin along the lower St. Lawrence.

Another branch of human history that concerns the Museum is physical anthropology, the study of the physical nature and variation of man. Such studies can be applied not only to living people, but also to those who are known to us only by their skeletal remains, preserved in ancient burials.

Early in its history the National Museum gave prominence to studies in this field, and after an interval is now reviving these, with a comprehensive programme to survey the pertinent material in all Canadian collections.

From what has been said, it will be seen that the National Museum of Canada plays a most important role in the collection of scientific data to advance our knowledge of Canada's natural history. The activities of *Homo canadensis* have also been studied insofar as his prehistory and his record of historic times have allowed. Although much remains to be done, the amount of scientific data that has been made available to the Canadian public is impressive. In the last three years, the scientific and popular publications of the Museum have run to 3,800 pages. In the last ten years the total amounts to 11,550 pages.

The research programme of the National Museum has been vigorous and productive, even in periods of financial restriction. In contrast, the public display of the collections has lagged badly in both extent and effectiveness. Two reasons may be given for this. The space in the Victoria Memorial Museum building allocated to exhibition shrank from six halls in 1910 to four in 1920, due to the expansion of the Geological Survey and the National Gallery. From 1916 to 1920, when the building was occupied by Parliament, and again during the Second World War, the Museum ceased to function as a centre of public display. Not until 1959, when Survey and Gallery departed from the Museum building, was it possible to begin a large-scale permanent exhibition programme.



The other factor that limited the success of the Museum's exhibition activities was lack of staff with training and experience in the design and construction of modern museum exhibits. Such exhibits as were prepared reflect the part-time efforts of people trained in other work. In spite of this a few outstanding exhibits were produced, such as the habitat groups of mammals and the figures representing Indians and Eskimos in their aboriginal settings.

After the partial renovation of 1947 the four halls of permanent exhibits in the Museum were assigned as follows: Hall of Fossils, Hall of Birds and Mammals, Hall of Biology and of the Eastern Indians, Hall of the Western Indians and the Eskimos. Displays in the Hall of Fossils were confined almost entirely to fossil vertebrates, including some remarkable examples of dinosaurs, but without any attempt at systematic arrangement. In the Hall of Birds and Mammals there were five first-class habitat groups of mammals. Opposite these was a systematic display of Canadian birds. In the corresponding west hall was a series of mammal specimens, along with miscellaneous displays of insects and of botanical material. The other half of the hall housed the exhibits of the eastern Indian cultures. The fourth

and largest hall contained representative specimens from the Museum's outstanding collection of West-Coast Indian material, from the Eskimo collection, and from that representing the Plains Indians. Great improvements had been made here over earlier arrangements. Other display areas were the balcony over the main entrance, which was occupied by a display of minerals, and the main hall or rotunda below, which was filled with a miscellany of geological exhibits, huddled around a large relief model of Canada.

In recent years the rotunda has been cleared, and used for a series of temporary exhibitions. Minor improvements have been made in the systematic displays of birds and mammals, and colour has been introduced into the ethnological exhibits. Meanwhile a staff has been assembled, consisting of designers, artists and technicians who know how to plan and construct attractive and instructive exhibits embodying the scientific integrity that a Museum must maintain. With the release of the space occupied by the Geological Survey and the National Gallery, seven new exhibition halls have been planned, four for natural history and three for the anthropological sciences. On the natural history side the visitor will enter a Hall of Geology, in which the principles of geological science will be explained by means of colourful displays of Canadian specimens, and dioramas illustrating Canadian geological localities. Beyond this will be the Hall of Fossils, with examples from the Museum's large and distinctive collection of dinosaurs. On the second floor the animals of Canada will be represented by exhibits and dioramas in a Hall of Birds, and by 12 life-size habitat groups in a Hall of Mammals.



On the opposite side of the building the anthropological exhibition series will begin with a Hall of Eskimos. There will be a small "preface" dealing with the physical nature of man, his racial groups, and something of prehistory and archaeology. In the Hall of the Eskimo the characteristic way of life of these people will be illustrated for both summer and winter, including their dwellings, tools and weapons and their methods of travel.

An entire hall on the second floor will be devoted to the Indians of the Pacific Coast, including spectacular examples of native art from the Bossom Collection. The second hall on this floor will contain exhibits illustrating the cultures of the Plains Indians, richly represented in the Museum's collections, of the Woodland Indians, so closely associated with the exploration of Canada, and of the Iroquoian Nations, second only to those of the Pacific Coast in their high standard of living.

In assigning these seven exhibition halls to the subjects mentioned, no provision has been made for the permanent display of botanical specimens, nor of the lower animals including the fishes and reptiles. Neither will the

Museum's large collection illustrating the development of European culture in Canada have place in the permanent exhibition series. For such materials a large area has been set aside on the third floor for temporary exhibitions, where they can be shown from time to time for periods of several months.

The interpretative work of a modern museum is not restricted to its exhibits. Also important are popular publications, lectures, guided tours, audiovisual aids and activities groups; these are usually grouped as educational services. In this field the National Museum of Canada was a pioneer, having begun regular lectures for children in 1912. Except for the interval of 1916-1920, this programme has been uninterrupted, and today about 20 lectures for adults and about 50 talks or motion-picture showings for children are given each year. Attempts to establish a corresponding series of lectures for adults in French have not been very successful but outstanding French speakers are presented whenever possible. The English-language series covers a wide range of subjects, such as travel, natural history, folklore, industrial processes, and more recently, music and folk-dancing. The lecturers, at one time nearly all staff members, now are mostly from outside Ottawa, and are invited because of eminence and speaking ability.

Direct work with schools was started when the Museum was still in Montreal, with the loan of specimens for class demonstration. This service has continued to the present, and a large series of mounted birds and mammals, and some archaeological specimens, are available. Although most of the loans are to Ottawa schools, they can be made to any school in Canada, the Museum paying half the transportation costs. The Ottawa Public Schools actually use the Museum as a classroom; each Thursday afternoon



during the school year some Grade 7 classes come to the Museum for lessons based on Museum exhibits. They are also shown motion pictures related to their studies. School classes from outside of Ottawa make pre-arranged visits, and enjoy the benefits of guided tours. Such tours are also available to groups other than school classes, and with French-speaking as well as English-speaking guides.

At one time the Museum conducted a lantern-slide loan service for all parts of Canada. A new loan service, based on the Museum's collection of 2" x 2" natural-colour slides, is being set up, and a set illustrating Canadian birds is available. In the loan of motion-picture films the Museum was also a pioneer. Today a large library of 16-mm. colour films with sound track is available from which to make loans. There is also a series of filmstrips, mostly based on the Museum's own materials. The large collection of photographs, many going back to the 19th century, and including pictures of great historical

significance, may be drawn upon for prints at a nominal charge. Cuts used in Museum publications are preserved, and are often borrowed for reprinting in black-and-white or colour. All of these visual aid services will be expanded, and so organized as to be more readily available to Canadians from Newfoundland to British Columbia.

By assisting the activities of clubs and hobby groups a museum can become an integral part of a community. The lecture hall of the National Museum has always been available for the use of educational or cultural groups. With the Ottawa Field Naturalists' Club the association has been long and intimate, and the Club and Museum have jointly sponsored the Macoun Club, a group of junior field naturalists. More recently the Museum has made special facilities available to the Ottawa Valley Mineral Association and the Ottawa Valley Weavers' Guild. On a national scale the Museum has made important contributions to the work of the Canadian Museums Association and the Canadian Folk Music Society.

It is in this field of extension services that the National Museum has its greatest opportunity to serve as the Museum of all Canada. The loan of specimens and visual aids is only a start. Part of the demand for information on Canadian plants, animals, fossils, Indians and Eskimos is being met by popular publications. The folk music collection has been drawn upon heavily in the preparation of song books, some published by the Museum, others by private publishing houses. Another important extension service of a museum is the loan of exhibits. The National Museum is embarking upon an extensive programme of bringing the Museum to the people across Canada. If local museums are unable to take advantage of such a service, other places of display, such as libraries and public halls, will be used.

The long-term loan of exhibits to individual museums represents another form of extension service. The National Museum has such exhibits in five Canadian museums, with more in preparation. Lecturers, who would accompany the travelling exhibits, set them up and speak about them, would be a valuable complement. Touring folk-singers could bring the Museum's rich collection of folk-songs to the Canadian people and do much to promote inter-regional understanding. A Haida or Kwakiutl wood carver could accompany an exhibit of West Coast Indian Art. With a mineral and gem display there might be a demonstration of the cutting and polishing of semi-precious stones. This combination of the travelling exhibit and the travelling lecturer offers many opportunities for bringing the Museum to the people.

What, then, of the future?

It appears that a Canadian Historical Museum will be established by 1967. Such a museum would include the present Human History Branch of the National Museum. The story of Canada's aboriginal and immigrant people could be told in the context of archaeology and of ethnological development. All Canadian endeavours in the folk arts and crafts and in historical achievement would be summarized or epitomized by the Canadian

Historical Museum. Indeed, the Canadian War Museum (which is now part of the National Museum) will be called upon to play a prominent role in the prospective Museum of History. A number of fascinating exhibits available elsewhere could be added. But the Canadian Historical Museum should be so designed as to avoid duplicating what is to be found in the 18 museums of the National Historic Parks. These museums are, as it were, magnifying glasses focussed on a regional slice of the nation's history.

Within a few years, one can expect that the National Aviation Museum will blossom forth as part of an eventual National Museum of Science, devoted to illustrating the contributions of science to Canadian life, and the contributions of Canadians to science. Many Canadians do not know about the first powered flight in the British Empire by a British subject J. A. D. McCurdy, the discovery of insulin by Banting and Best, the development of the hydrofoil boat, and other scientific contributions associated with Canada. Future generations will be given the opportunity of seeing these Canadian contributions in the context of the world-wide progress of science.

It is too early to say whether the National Museum of Canada will embrace all museums—the Canadian Museum of History, the Science Museum, the Natural History Museum—and be the parent body of a series of semi-autonomous federated museums, or whether it will revert to the form in which it first developed; that is a major museum of natural history. Two things are clear. The National Museum (and its offspring if the other museums are to be such) will continue to develop as a first-class centre of learning that will attract scientists and scholars from all over the world. It will also increasingly carry to Canadians and to the world a message of knowledge and of understanding of man and his environment.

In the fiscal year 1960-61 about 450,000 persons saw exhibits of the National Museum, the Canadian War Museum and the National Aviation Museum. With the programmes that are being planned, this attendance should double so that by 1967 at least a million persons a year will be enjoying the benefits of the Nation's premier museum and one of the world's centres of culture.



Annual Report

Department of Northern Affairs and National Resources

Introduction

“Northern Affairs and National Resources” is the most recent of several names under which this department has operated almost since Confederation. It was then and is today a development department charged with encouraging growth and progress in the northern territories and by various forms of assistance, aiding orderly and sane use of national resources.

Seven branches form the Department.

The Northern Administration Branch bears heavy responsibilities for the economic and social development of the Yukon and Northwest Territories and for the welfare of the Eskimo people.

The National Parks Branch is the administrator of Canada's National Parks and National Historic Sites and Parks, conserving for future generations the richness of Canada's past and the wonders of its natural beauty. The Canadian Wildlife Service, forming part of this Branch, is the federal agency responsible for national wildlife conservation and research.

In the resources field, the Water Resources Branch collects and evaluates basic information on Canada's water-power resources and studies broad questions of water use policy.

The Natural History and Human History Branches form the National Museum of Canada which is engaged in scientific research in natural history, archaeology, and anthropology.

The Canadian Government Travel Bureau works in many ways to increase the tourist traffic, its major effort being the vigorous promotion of Canadian tourist attractions in the United States.

To serve these various operating Branches are the administrative divisions—Economic, Editorial and Information, Legal, Personnel, and Purchasing—which, under general direction from the Chief Administrative Officer, comprise Administration Services.

Certain Boards, Commissions, and Advisory Committees report to the Minister. These include the Historic Sites and Monuments Board of Canada, the National Battlefields Commission and the Advisory Committees on Northern Development and on Water Use Policy. The Secretariat of the Resources for Tomorrow Conference reports to a Federal-Provincial Committee of which the Minister is Chairman.

Northern Administration Branch

The Northern Administration Branch is concerned with the administration of the Northwest Territories and the Yukon Territory, Eskimo affairs, and the resources of both territories as well as certain Crown lands and mineral rights in the provinces which are the responsibilities of the federal government. The territorial governments have powers roughly analogous to those of provincial governments. The territorial civil service in the Yukon administers all territorial matters from Whitehorse, but in the Northwest Territories, the Branch provides administrative machinery for the territorial government.

The Branch is managed by a Director and two Assistant Directors who supervise the six Divisions and the Offices of the Administrator of the Arctic, and the Administrator of the Mackenzie; it also has certain responsibilities in connection with the Commissioner of the Yukon.

The Education Division operates the school system of the Northwest Territories, except for two school districts in Yellowknife and a separate school district at Hay River, and also operates schools for Eskimos in Arctic Quebec.

The Engineering Division is responsible for Branch construction and maintenance and the supervision of the financing of the "Roads to Resources" program.

The Industrial Division is responsible for industrial liaison, area and community planning, market research, co-operatives, the operation of a Northwest Territories tourist office and the development of handicrafts, resource harvesting, and other activities to improve the economic well-being of northern people.

The administration of mineral and other major resources (excepting game) is dealt with by the Resources Division.

The Territorial Division is concerned with the administration of the legislation of the Northwest Territories, municipal affairs, and with certain functions connected with the office of the Commissioner of the Yukon Territory.

The Welfare Division is responsible for welfare services in the Northwest Territories and for welfare services to Eskimos in Arctic Quebec and southern Canada.

Decentralization

Decentralization of the Branch's administrative functions in the Northwest Territories to the offices of the Administrator of the Arctic and the Administrator of the Mackenzie progressed satisfactorily. A personnel officer and a financial officer were appointed to the Fort Smith district office. A complete revision of administrative procedures was begun and recorded in an administrative procedures manual. A stores control system and revolving

fund were established in the Fort Smith office. The same facilities will be extended to the Churchill and Frobisher Bay regional offices during the coming year.

The Office of the Administrator of the Mackenzie

This Office, with headquarters at Fort Smith, provides staff for the administration of federal responsibilities in natural resources, education, and welfare in the Mackenzie District and Banks and Victoria Islands. Administrative services are also provided for the Territorial Government.

The District comprises three Administrative Regions with headquarters in Fort Smith, Yellowknife, and Inuvik. Area headquarters are maintained in Hay River, Aklavik, Tuktoyaktuk, Coppermine, and Cambridge Bay.

District Economy

Gold mines of the Yellowknife area and oil at Norman Wells remain the major revenue-producers. Most of the population has a subsistence economy partially dependent on hunting and trapping.

The Eldorado Uranium Mine at Great Bear Lake ceased operation after a long and important contribution to the economy. Construction continued at Flat River where a tungsten mine is scheduled to commence construction in 1961. A survey for the railway to Great Slave Lake began. At Pine Point substantial quantities of lead-zinc ore await transportation facilities. Exploration for oil has continued throughout the Mackenzie Valley.

Opportunities for wage employment remained reasonably static. A group of Eskimos at Coppermine established a Producer's Co-operative for marketing stone carvings.

Increased interest has been shown in the tourist business, particularly in the Great Slave Lake area and in the Mackenzie Delta area.

Education

Thirty schools, with 158 classrooms, had a total enrolment of 3,614 for an average of 22.2 pupils per classroom. This enrolment is comprised of 603 Eskimos, 1,143 Indians, and 1,868 other pupils. Enrolment increased 243 over last year, accounted for by an additional 69 Eskimos, 43 Indians, and 131 other pupils.

In 1960 the new federal school and residences opened at Fort Simpson. The two residences with a total capacity of 200 pupils accommodated 121 in the first year of operation. Two hundred and forty pupils were enrolled in the federal school at Fort Simpson in March 1961. A two-classroom school at Old Crow, Yukon Territory, and one-classroom schools at Snowdrift and Nahanni Butte were constructed.

Vocational training courses in auto mechanics, carpentry, and heavy-duty equipment, and matriculation and high school leaving academic courses

were offered at Sir John Franklin School, Yellowknife. Industrial arts classes were conducted by schools in Fort Smith, Hay River, Rae, Fort Simpson, Fort McPherson, and Inuvik.

The fur garment project established at Aklavik was an important training aid for local crafts. Over thirty students went to the provinces for training in various courses unavailable in the Territories. On-the-job training was carried out in industries such as mining and in heavy-duty equipment operation.

Forests

The two major sawmill operations in the Peace River—Slave Lake area continued on an increased scale. The total production was 18,325,306 board feet, an increase of slightly more than a million board feet over the previous year. Four new timber berths were established at Hay River, Fort Simpson and Norman Wells making a total of 9 active berths in the District.

During the year a fire tower was erected at Tsu Lake and sites cleared for towers at Kakisa Lake and Yellowknife. At Fort Smith a warehouse for fire suppression equipment was completed, and two acres of forest near the warehouse were cleared to be used as an arboretum and nursery.

Mining

The Mining Recorder's office at Yellowknife reported a decline in staking activity during the year, 1,210 claims being recorded in the past fiscal year compared to over 4,000 in 1959-60. In March 1961 over 8,000 mineral claims were in good standing. All mines inspected during the year showed an improved safety record. Oil exploration increased noticeably.

Wood Buffalo National Park

The largest of Canada's national parks, comprising over 17,000 square miles, is set aside for the preservation of the wood bison, commonly known as the wood buffalo. Although some have intermingled with prairie bison, a number of true wood bison have been identified and will be segregated north of Great Slave Lake to preserve the species. The buffalo suffered considerably from the worst winter weather conditions encountered in over forty years. Heavy snows early in the winter, followed by intermittent thaws and periods of severe cold, formed layers of ice which hampered foraging in the eastern grazing areas, particularly for calves and yearlings. When the buffalo endeavoured to leave frozen areas for other pastures many casualties resulted. During thaws other animals bogged down in the marsh and mud and were unable to extricate themselves. A loss of 2,000 animals is estimated out of a total population of 14,000.

Welfare

Welfare programs concentrated on basic needs with emphasis on child care problems. During the year a transit centre opened at Inuvik, a welfare centre at Aklavik, and a children's receiving home at Fort Smith. At the

rehabilitation centre under construction at Inuvik a partial program commenced, including processing and marketing of fish products and handicrafts. A winter logging program produced material for local construction when the rate of employment was low.

Engineering

With the opening of the Great Slave Highway, linking Yellowknife to Fort Providence, the total length of the Territorial Highway System is now approximately 370 miles. Through this system, Yellowknife, Rae, Fort Providence, and Hay River have highway access to Alberta.

Fifty-four miles of road were constructed in the Fort Smith region. At Fort Simpson the Snye Crossing was rebuilt and twelve miles of the airport road were improved. Work on the community road program was continued at Cambridge Bay, Aklavik, Fort Norman, Fort Simpson, Rocher River, and Fort Smith.

Major building projects included a school and hostels completed at Fort Simpson, and an abattoir nearing completion at Hay Camp and in Wood Buffalo National Park. Residences and warehouses were constructed at many of the smaller settlements throughout the District. One hundred and seventy-seven projects were undertaken during the year, 68 of these in excess of \$5,000. All but eleven were completed during the year.

Game

The Northwest Territories Council approved a new Game Ordinance to become effective July 1, 1961. The main changes related to eligibility for general hunting licence, and big game hunting regulations.

The caribou situation remained critical throughout the year and in October barren ground caribou were declared by an Order-in-Council to be a species in danger of extinction. The predator control program was continued on a reduced scale since the number of caribou taken by wolves is now much reduced and the number of wolves is believed to be under control.

Two outfitting firms handled the sport hunting of bison. Local men were trained and employed as guides.

Trappers' representatives from all areas of the District attended meetings at Fort McPherson and at Lac la Martre with representatives of Indian Affairs and Northern Affairs to discuss the reorganization of trapping areas and the defining of boundaries between group areas.

The Office of the Administrator of the Arctic

This office, with headquarters in Ottawa, is responsible for the administration of the Districts of Keewatin and Franklin (except Victoria and Banks Islands) and the administration of Eskimo affairs in Arctic Quebec. It comprises seven sections: Education, Engineering, Welfare, Personnel, Financial, Property, and Office Services. Area offices at Rankin Inlet, Coral

Harbour, Eskimo Point, and Baker Lake report to regional headquarters at Churchill, Man. Area offices at Cape Dorset, Igloolik and Hall Lake report to regional headquarters at Frobisher Bay. Arctic Quebec area offices at Fort Chimo, Sugluk, Port Harrison, and Great Whale River report directly to the district office. The area office at George River reports through Fort Chimo. In communities where no administrators are posted, community principals and teachers carry out many administrative duties.

Eskimo Economy

Permanent wage employment is increasing slowly in such centres as Churchill, Frobisher Bay, and Rankin Inlet, but those still living on the land urgently require a diversification of the economy, particularly in parts of Keewatin and Arctic Quebec.

The white fox cycle was at its peak only in parts of Arctic Quebec. Catches varied in Keewatin and Franklin. Although the price paid to the Eskimos by traders declined from \$25 per pelt in 1960 to \$9.75 early in 1961, some Eskimo hunters and trappers produced a large quantity of pelts, thus compensating for the lower price.

Some Eskimos found seasonal employment with mining exploration companies, government survey parties, and stevedoring companies. The best hope for improvement in some areas, however, lies in local economic development projects organized by field officers in co-operation with specialist officers of the Industrial Division. Commercial fisheries and logging in the George River-Port Burwell area, a commercial fishery at Frobisher Bay, a tourist operation, and seal skin stencil and stone cut prints from Cape Dorset, and stone carvings and handicrafts from a number of other communities brought increasing revenue. Fisheries for domestic use were organized by field officers at Baker Lake, Rankin Inlet, and other points.

Engineering Services

Construction crews operating out of Churchill, Fort Chimo, Frobisher Bay, and Great Whale River under the direction of the Arctic District Engineer, carried out work in twenty-four communities. For a list of departmental buildings commenced or completed see "Engineering Division". Buildings constructed for other departments included a nursing station for the Department of National Health and Welfare and works buildings for the Department of Transport. In addition to the main construction program twenty-two generators were installed and renovations were made to existing buildings taken over from other departments or obtained through Crown Assets Disposal Corporation. The Arctic District Engineer also assumed responsibility for the erection of minor works buildings for the Department of Transport and the Department of National Health and Welfare. Contracts were arranged for the installation of water and sewer systems at Great Whale River and Akudlik at Churchill, projects scheduled for completion in the autumn of 1961.

The Department purchased 138 small houses of which 49 were prefabricated and 89 of rigid-frame design. These were sent to 27 settlements as low cost housing for Eskimos, prefabricated dormitories for Eskimos undergoing rehabilitation, and as temporary sewing centres and transient quarters. Most of these were erected, excepting those planned for Arctic Bay and Pangnirtung which were not delivered. The construction was carried out by co-operation between field technical officers and the prospective Eskimo purchasers.

Bulk oil storage facilities were installed at Great Whale River in 1961. Oil storage facilities are 65 per cent completed at Chesterfield Inlet and the remainder will be completed in 1961. Arrangements were made by contract to provide this equipment at Baker Lake.

Education

Under the direction of the Arctic District Superintendent of Education, 59 federal classrooms were in operation in 26 schools with the total enrolment of 1,259 Eskimo children (40 per cent of the Eskimo school age population), 30 Indians, and 94 others. In addition, three part-time mission schools received grants-in-aid based on minimum attendance. Four seasonal schools operated during the summer. Sixty-one teachers, two teachers' aides and two vocational training instructors were employed. Two new schools and nine additional classrooms are being erected for opening in September 1961. Small eight-pupil hostels opened at Port Harrison, Baker Lake, Great Whale River, and Payne Bay. Sixteen additional hostels will be ready for occupancy in September 1961.

Teachers in most communities have made a beginning in adult education with classes in home-making, cooking, child care, and basic English.

A four-month course for 15 Eskimos being trained to operate and maintain diesel electric power plants in northern settlements began in March at the RCME school, Barriefield, Ont.

Twenty-one students from various communities in the Arctic District were enrolled in the Sir John Franklin School, Yellowknife, in heavy-duty equipment operator's, mechanic's, and carpenter's courses. Twenty-nine trainees participated in short courses in prospecting and mining at North Rankin Inlet Nickel Mines. Two Eskimos at Frobisher Bay and Churchill trained as electrician's apprentices and two in Churchill trained as plumber's and mechanic's apprentices.

An orientation course for new teachers was held in Ottawa in August 1960. In January and February 1961, one week teachers' workshops were held in Churchill, Frobisher Bay, and Great Whale River.

Welfare

During the year the organization of welfare services in the field made significant gains. The welfare section began with a staff of four: the superintendent of welfare, a medical social worker, and two clerks. The supervisor

of welfare for the Frobisher Bay Region and the area social worker for the growing community were appointed. Two Eskimos in technical and managerial positions joined the staff of the rehabilitation centre. A new rehabilitation centre was established at Rankin Inlet, and staffed with a superintendent of rehabilitation and a social worker. An area social worker was posted to Churchill to provide welfare services for Eskimos in that area and to supervise the operation of the three children's receiving homes, the old people's home, and the transit centre. The position of regional superintendent of welfare at Churchill and other positions in Arctic Quebec and at Baker Lake remained unfilled because of the lack of trained social workers.

The rehabilitation centre at Frobisher Bay continued to serve persons handicapped by long periods of hospitalization and by other medical and social factors. Such projects as a bakery, coffee shop, handicraft centre, theatre, barber shop, woodworking shop, sewing centre, and organized hunting and fishing, provided retraining. Several of the rehabilitants then undertook further vocational training in the south and the final step towards individual or co-operative ownership and management of small commercial enterprises.

The rehabilitation centre at Rankin Inlet began its operations with projects such as handicraft production, organized hunting and fishing, net making and fly-tying.

Property Section

The property section is responsible for requisitioning and shipping supplies and materials to the North. During the summer a warehouse was operated at Montreal under the supervision of expeditors from the Arctic Office to receive and distribute supplies to northern settlements. Some two thousand tons of supplies excluding petroleum products were received and prepared for shipment on the annual sea-lift. Two Eskimos hired for on-the-job training proved very satisfactory. Eleven hundred tons of cargo were shipped from Churchill in a similar operation.

Financial Section

The Financial Section is responsible for financial matters in the Arctic District, including cost control and the preparation of estimates for Welfare, Industrial, Engineering, and Administration Services. Each month this section provides the Regional Headquarters with a breakdown of expenditures by area for these services and a final statement at the end of the year. Under the decentralization program, additional duties have been given to this section, the latest being the transfer of the processing of suppliers' invoices from the Purchasing Division.

General

Officers of the Arctic District Office arranged the Eleventh Annual Meeting of the Committee on Eskimo Affairs in Ottawa, on March 28 and

29, 1960. This meeting was distinguished by the attendance of Eskimo delegates who had for the first time in 1959 attended these meetings. Because the committee is concerned with both Arctic and Mackenzie Districts, beginning in 1961 the meetings will be arranged by the Branch Headquarters.

Members of the Arctic District Office participated in the annual Eastern Arctic Patrol on the C.G.S. *C.D. Howe* during the summer months and air patrols were made to many communities by district, regional, and area officers.

Representatives of the District Office took part in meetings of a number of committees including the Interdepartmental Meteorological Committee, the Interdepartmental Committee on Fur Promotion, and the Canadian Board on Geographical Names.

Education Division¹

The aim of the Department is to provide elementary education and secondary academic or vocational education for young people and adults with special aptitudes. This program is being developed by the construction of new government schools and students' residences, by providing bursaries and other aids for students, by development of special curricula for northern schools and by conducting special vocational education projects.

Education in the Northwest Territories is the joint responsibility of the Federal and Northwest Territories Governments. The Federal Government is responsible for the education of Indians and Eskimos, the Territorial Government for the education of others. Except in organized school districts, the Department operates an integrated school system on behalf of both governments, each contributing towards the cost in proportion to the number of children enrolled. The Department also constructs and operates schools for Eskimos in northern Quebec.

The only organized school districts are Yellowknife Public School District No. 1 and Yellowknife Separate School District No. 2. The Separate School ratepayers of Hay River have petitioned for the establishment of a third district. The school districts are financed partly by local taxation and partly by grants-in-aid from the Federal and Territorial Governments. The Education Division provides inspection and supervisory services.

The school system in the Yukon Territory is operated by the Government of the Yukon (except for the school at Old Crow, operated under the Mackenzie Administrator). The Federal Government pays fees to the Territorial Government on behalf of children of federal employees living in tax-exempt premises and pays the cost incurred by Yukon's schools on behalf of Indian children. Although the Education Division has no responsibility for the operation of these schools, it advises the Minister and the territorial authorities on educational policy relating to the territory.

To provide for children who are now without school facilities and for natural increase in population will require about 20 classrooms per year.

¹ See Appendix B, 4, 5, 6 and 7.

Curriculum

The preparation of programs of studies and of instructional materials specially designed to meet the needs of northern schools continued throughout the year. A new primary reader was introduced to schools in Eskimo territory and a revised social studies program for Grades 1 to 6 was introduced into selected schools. At conferences and workshops, teachers received guidance and instruction on the adaptation of programs to local situations, on the teaching of English as a second language, and on the role of education in a changing society. Plans were made for reorganizing the curriculum section.

Vocational Training

The vocational training program, directed mostly toward young people who have not had an opportunity to attend school, frequently combines trades training with accelerated instruction in basic academic subjects. In future, an increasing number of trainees will come from the elementary and secondary school system, having shown special interests or aptitudes.

The Sir John Franklin School, Yellowknife, the principal training centre in the Territories, offers courses in carpentry and building construction, auto and diesel mechanics, heavy equipment operation, and food services. Special group courses are conducted to meet specific needs. On-the-job training and placement in technical institutes in southern Canada are also arranged. Registrations for training in 1960-61 are given in Appendix B.

Adult Education

To achieve greater co-ordination and expansion of adult education activities, an adult education section was created under the direction of the chief who was appointed in August 1960. Needs are being assessed and plans are being laid to formulate programs. Evening and, where possible, daytime adult classes were conducted in various subjects including home-making, English, arithmetic, arts and crafts.

Hostels

Pupil residences at various centres accommodate children who would not otherwise attend school regularly because their parents lead a nomadic life. Others come from settlements with insufficient population to warrant a school. Hostel accommodation totals 1,216 beds of which 1,100 are in the Mackenzie District and 116 in the Arctic District.

Engineering Division

Despite an 8.5 per cent increase in housing costs in southern Canada between 1957-58 and 1960-61, housing costs in the North, based on a three-bedroom house, were reduced by 23.1 per cent. Prefabrication and improved design were largely responsible for this reduction, as well as for lower maintenance costs.

The use of bulk oil storage tanks in northern settlements, replacing one of the trademarks of the North—the oil drum—resulted in savings which will reach \$430,000 when the program is completed in 1962. At Great Whale River, for example, the annual savings will be approximately \$83,000, including amortization of the capital cost of the tank and distribution system.

In co-operation with the Industrial Division, a policy for the sale of power and fuel oil to private consumers in remote locations in the North was worked out. This will prevent duplication of facilities and will greatly reduce the operational cost of missions, small enterprises, and private citizens.

As part of the decentralization of the Branch's administrative functions to district administrators many engineering responsibilities were assumed by district engineers, resulting in better supervision of the construction and maintenance program. A brief outline of the work of the Engineering Division carried out through district engineers during 1960 is as follows:

Mackenzie District, N.W.T.

Expenditure on road construction in the Mackenzie District during 1960 amounted to approximately \$4,000,000. Major contract work was handled by the Department of Public Works on behalf of Northern Affairs. The extension of the Mackenzie Highway to Yellowknife, a major item in the program, was opened to traffic in September with only minor work to be completed in 1961. Completion of the surface, gravelling, and the ferry for the Mackenzie River crossing near Fort Providence is scheduled for 1961. From Fort Providence to Yellowknife the road has now been named the Great Slave Highway, while from Fort Providence to the Alberta border it remains as the Mackenzie Highway. The road from Enterprise to Hay River is now known as the Hay River Highway. Starting in 1961 the entire highway system will be maintained year-round by the Department.

Reconstruction continued on the Hay River Highway and on the second year of a five-year program on the Mackenzie Highway between Enterprise and the Alberta border. The rough grade on the Frank Channel to Rae Road was completed and the road opened to winter traffic. During the winter, Indians cleared 40.5 miles of right-of-way in preparation for the MacKay Lake Road from Yellowknife. Work was carried out on the roads from Fort Smith to Peace Point, from Fitzgerald to Rock Point, and on roads and trails in Wood Buffalo National Park.

Expenditure on buildings and works in the Mackenzie District approximated \$2,000,000.

The Fort Simpson water and sewer system, the extension to the Fort Smith water and sewer system, and a water collection and treatment plant at Hay River were completed and work commenced on a water and sewer system for Fort McPherson.

Construction of an abattoir at Hay Camp in Wood Buffalo National Park was begun; new schools were completed at Old Crow and Norman

Wells, warehouses, powerhouses and other buildings were constructed, and a number of existing buildings were altered or renovated.

Districts of Keewatin and Franklin, N.W.T., Northern Quebec and Churchill

Construction expenditures in this District, confined almost entirely to buildings and works, totalled about \$2,000,000.

Fifty-three houses were constructed for Eskimo employees at DEW Line sites bringing to ninety-five the total constructed over the last three years. Forty-eight housing units for employees, twelve schools, and six hostels were commenced or completed. Five of these schools were complexes including living accommodations for the teacher and a janitor. Warehouses, powerhouses, bulk oil storage facilities, and miscellaneous buildings were constructed in new and existing settlements.

The Frobisher Development Group completed its studies on the town-site development and the proposed plan was submitted for Government consideration.

Yukon Territory

Expenditure on road construction in the Yukon Territory approximated \$3,000,000 in 1960-61. The Flat Creek-Eagle Plain Road was constructed to Mile 60 and a winter road was extended from Mile 60 to Mile 72 for completion to Mile 72 in 1961-62. The road from Watson Lake to Ross River was begun and the grade completed to the Francis River at Mile 36 from Watson Lake. Indians cleared the right-of-way to Mile 68 during the winter.

The Pelly River and Stewart River bridges on the Whitehorse-Keno Road were opened to traffic and the reconstruction of the road continued. Reconstruction continued also on the Stewart Crossing-Dawson Road. Investigations were carried out on the Ogilvie and McQuesten Crossings where new bridges will be constructed in 1961-62.

Expenditure on buildings in the Yukon Territory during 1960-61 amounted to about \$200,000. Warehouses, garages, and houses were constructed for the Yukon Forestry Service and a new Forestry Administration Building was designed for Whitehorse for completion in 1961-62.

Roads to Resources

A total of \$86,619,408 was approved for work carried out by the provinces up to March 31, 1961. The Federal Government's share was \$43,309,704. The federal share of claims received as of March 31, 1961 totalled \$25,835,244. The Division continued to administer these agreements.

Industrial Division

The Industrial Division is responsible for the stimulation of economic growth, development of renewable resources such as fish and marine mammals, and the planning of townsites and community services to meet population and industrial expansion. The participation of the Eskimos in the economic growth of their country is emphasized.

Projects

The economic development program begun in Eastern Ungava Bay in 1959 increased its output. The George River fishery produced approximately 24,000 pounds of char for sale on northern markets. At the sawmill erected at George River, 450 logs were stockpiled for future local house construction. Although the Port Burwell freezer began late in the season, 6,000 pounds of char were taken for sale. Eight thousand pounds of cod were split, dried, salted, and shipped to Fort Chimo for local sale. Seal skin handicrafts from Port Burwell were enthusiastically received on the southern market. Cod from Port Burwell was bartered for firewood from George River. The Frobisher Bay fishery, established in 1958 as a pilot project, produced 10,000 pounds of char for sale in the south.

Two forty-foot long-liner boats were sailed to Rankin Inlet and Port Burwell where they proved generally suitable for northern resource harvesting.

Technical information and guidance stimulated the production of carvings. The purchase and sale of Eskimo carvings continued to be handled by the Hudson's Bay Company and the Canadian Handicrafts Guild. In February, 1961, an exhibit of the 1960 collection of Eskimo prints (the third annual collection) was held in the Parliament Buildings in Ottawa. As in previous years, the prints were quickly sold out, the demand far exceeding the supply. Tanned seal skin crafts, exhibited at the Design Centre in the National Gallery of Canada, created wide public interest. The seal skin birds and tapestries were sold by the Canadian Handicrafts Guild in a matter of hours. A major hat company has indicated interest in seal skin hats and has given advice on means of overcoming technical problems, particularly in sizing.

Information from experiments with synthetic substitutes for native clothing was correlated and sent to field officers.

Fisheries established at Fort McPherson and Aklavik produced 13,000 and 3,000 pounds of whitefish respectively. The fish were processed as they were taken in freezers mounted on barges.

Two men were given a five-year contract to manage the reindeer herd and plan to make the industry economically self-sufficient through new herding practices. The herd of six yak was transferred from departmental management in Ottawa to a private game farm near Edmonton, where they will be studied in a climate closer to their natural habitat to ascertain their possible suitability as northern meat producers.

Co-operative Associations

Co-operatives established during the year at Resolute Bay, Coppermine, and Yellowknife engaged in handicrafts, fur marketing, and co-operative retailing. The three co-operatives established in 1959 continued their fishing, handicraft and print-making operations with increasing success. Three more co-operatives at Holman Island, Fort Chimo, and Cambridge Bay are being given assistance to enable them to expand their activities in the future.

The first co-operative development officer to take up a permanent field posting went to Frobisher Bay. Another co-operative development officer permanently stationed in Ottawa is responsible for co-operatives on the coast of Hudson Bay and at Resolute. Although co-operative development to date has been mainly in the Eastern Arctic, the Department will proceed with development in other areas of the Northwest Territories when staff is available and time permits.

Industrial Promotion

To keep up with the marked growth in production and development of new Eskimo products, the Industrial Division expanded its program of market promotion and research.

Frequent visits were made to leading brokers and specialty retail outlets to maintain at a high level the presentation of products to the consumer. Promotional activity included personal visits, radio interviews, television appearances, and creation of distinctive displays and exhibits to convey the excellence of northern products. Members of the Division met with leaders in associated industries to determine the best methods of production and product presentation to build a sound foundation for future projects in marketing techniques.

Several field trips were made to learn production problems, assess the economic potential of the projects, and advise on better methods of operation. Local northern markets were assessed and northern residents were given the opportunity to purchase northern products at reasonable prices. The demand for Eskimo products now far exceeds the supply.

Area Economic Surveys and Community Planning

The series of area economic surveys initiated in 1958 continued with a survey along the east coast of Hudson Bay from Port Harrison to Cape Jones including Great Whale River and the Belcher Islands. As a result a small Eskimo commercial fishery and a canoe building project were started. Technical specialists are working closely with the Eskimos to improve seal and other resource harvesting and to produce more diversified quality handicrafts.

The Division undertook special planning studies of a number of northern settlements including Fort Simpson, Hay River, and Rae, to improve and control land-use development. The Department also conducted a social and

economic study of families living in depressed circumstances in and near Whitehorse. An extensive scheme for urban renewal and improved housing was drawn up with the co-operation of Central Mortgage and Housing Corporation and the city and territorial governments. When the scheme is completed over two hundred and fifty families will be relocated in healthier planned areas in accommodation they can afford. The Division also investigated the economy of new single enterprise towns in Canada which may set a pattern for future communities in the North.

The Department initiated a new program of loans and grants to enable Eskimos to own houses. Housing was designed for maximum insulation and endurance at minimum cost. A similar scheme for all other residents of the Northwest Territories and Yukon is being considered. The Department loaned funds to the territorial governments for second mortgages of up to \$2,000 on the purchase of houses under the National Housing Act.

Tourist Office

Tourist development continued in the Mackenzie District particularly in the Great Slave Lake area and spread more slowly in the Arctic areas because of the comparative lack of transportation and accommodation.

Approximately 1,000 tourists visited the Territories during 1960-61, a 25 per cent increase over the previous year, most of them anglers attracted by the virgin waters of the North. The second annual buffalo hunt in the Fort Smith area attracted 49 big-game hunters. The remainder were casual travellers. Accommodation improved markedly. One new hotel was built and another expanded. Six new tourist camps were established mainly on Great Slave Lake. At year-end there were 10 hotels and motels, 7 tourist camps with lodge or cabin accommodations, and 4 tourist camps with tent facilities.

More inquiries were received not only about the main tourist attraction, angling, but also regarding tours to see the country, its people, its flora and fauna. Hunting was the third-ranking attraction, partly because of limitations for sport hunting by non-residents. Increased interest was shown in the Mackenzie Highway System and in canoe and boat trips particularly on the Mackenzie River System. The completion of the Great Slave Highway to serve Fort Providence, Rae, and Yellowknife is expected to bring a significant flow of tourists to these communities. The Northwest Territories Tourist Association completed a successful first year of operation. Acting primarily as an advisory body it also laid the basis for a program to encourage the growth of the tourist industry.

The Northwest Territories Tourist office, established as a part of the Industrial Division, will assess, develop, and promote tourist traffic in the same way as provincial government travel bureaus. Its first partial year of operation has concentrated on basic planning and organization and an assessment of the tourist potential of the Territories.

Resources Division

The Resources Division is responsible for administration of major resources—lands, timber and minerals of the Yukon Territory and the Northwest Territories. The mineral rights and surface rights of certain lands under federal control in the provinces are also administered by the Division.

Recommendations for the development and management of the resources of the North—land disposition and management, land use, mineral disposition and control of production, timber management and plans for the northern development road program—originate in the Division.

Two major achievements were the approval of revised policies for the disposition of land and mineral rights. These policies were put into effect by completely revised Territorial Lands Regulations and Canada Mining Regulations. Considerable progress was made on the revision of policy for disposition of oil and gas rights. Revised Timber Regulations are being prepared.

A continued and quickening interest in development of the North was apparent throughout the year.

Mining—Northwest Territories

Mineral claims recorded totalled 1,873, considerably fewer than in the previous year. The Arctic and Hudson Bay Mining District, however, showed a small increase. Four mines were in production and one closed down. No new mines came into production. The total value of minerals produced decreased by 8.5 per cent from the previous year. The decrease was attributed to the closing of the uranium mine at Port Radium which had been operating for more than 25 years.

Greatest staking activity occurred in the Matthews Lake area with some activity also in the Mackenzie Mountain area, Yellowknife gold belt, and Kaminak Lake near Eskimo Point. A base metal discovery on Little Cornwallis Island is being investigated.

Mining and milling equipment were transported to a gold property in the Barren Lands to permit development work to be done. An 80-mile road will be built from Mile 65 on the Watson Lake–Ross River Road to connect with an access road to the tungsten deposit in the Flat River area of the Mackenzie Mountains so that concentrates may be shipped by 1963.

The Canada Mining Regulations were revised to separate the miner's licence from the status of a mineral claim, to amend the length of claim tenure and to introduce prospecting permits. New assessment work credits will be granted, and perimeter surveys will be allowed. Royalty provisions have been modified and transitional clauses included to ensure that existing rights will not be abrogated.

Twenty-seven prospecting permits were granted to six companies in the Keewatin District and the Nahanni area. One company plans work on a base metal property on Strathcona Sound.

Mining—Yukon Territory

In the three mining districts of the Yukon Territory 1,291 quartz claims and 64 placer claims were recorded.

The areas of greatest lode activity were Kathleen Lake, Ketza River, Tinta Hill, Frances Lake, Shakwak Valley, Montana Mountain, and Hyland River. Development work is planned for a gold property on Montana Mountain and on other showings nearby.

Changes in the northern development road policy deal with assistance in road building to small companies in the prospecting stage.

The lode mine in the Mayo District, now reputed to be Canada's leading silver producer, had a profitable year. This company employed an average of 534 persons in development work on several properties.

Most placer operations were in the Klondike area. Small placer projects were worked in the area of Sixty Mile River, Clear Creek, Henderson—Thistle Creek, and Forty Mile and Twelve Mile Rivers. Plans were made for testing a placer operation on Duncan Creek.

Lands

New land regulations for the Yukon Territory and the Northwest Territories reduce administrative procedures to a minimum. Disposition of land will now be carried out in the field. Maximum allowances for areas outside the townsites are two acres for residential purposes and five acres for ordinary commercial use.

Yukon Territory

The number of land sales negotiated and the number of leases issued increased by approximately 25 per cent during the year. Subdivisions of lots suitable for summer cottages were made available at Louise Lake, Fish Lake, Marsh Lake, Tagish, and Mile 897 of the Alaska Highway.

Lots in the townsites of Carcross, Haines Junction, Keno City, Teslin, and Whitehorse were transferred to the Government of the Yukon Territory. Letters patent were issued for lands to the value of \$106,937.58, of which this report accounts for \$18,644.58. The balance, \$88,293 represents revenue from lots sold by the Government of the Yukon Territory in subdivisions under its management.

The Lands and Forest Section purchased or acquired ten parcels of land, and sixty-three additional parcels were made available to departments of the Government of Canada and to the Government of the Yukon Territory.

Under the authority of the Territorial Quarrying Regulations, 57,476 cubic yards of sand and gravel, 4,890 yards of clay and 220 cubic yards of rock were removed.

Because of increased highway traffic new public camping and recreational areas were provided at Big Creek, Marsh Lake, and Tagish in the

Whitehorse area; at Twin Lakes, Tatchun Creek, and Mayo Lake in the Mayo area; at Moose Creek, Klondike River, and Dawson in the Dawson area; and at Quiet Lake on the Canol Road.

Northwest Territories

The increase of approximately 15 per cent in the number of leases in force during the year consisted almost entirely of commercial properties. Two new subdivisions and a number of access roads were surveyed as part of the Fort Smith Development Plan.

Public camping and recreation areas were provided on the Mackenzie Highway near the Alberta-Northwest Territories boundary, at Hay River, and at Lady Evelyn Falls on the Kakisa River.

Many inquiries have been received and a number of leases have been issued for lands along the Great Slave Highway to Yellowknife. The increased use of this highway is expected to promote interest in adjacent lands particularly at the junctions at Enterprise and at Frank Channel where subdivision lots are available.

Forty-two parcels of land were set aside for the use of departments and agencies of the Federal Government, and eleven parcels were purchased or acquired for use of this Department.

Forests

The Division has assumed responsibility for forest protection in the Yukon, Mackenzie District, and Wood Buffalo National Park. The forestry officer appointed to carry out this work is revising the Territorial Timber Regulations.

Yukon

Forty-nine forest fires burned a total of 21,102 acres compared with 59 fires and 3,414 acres in 1959. Campers caused 53 per cent of the 1960 fires while 14 per cent was caused by lightning. Favourable weather, better detection by air and ground crews, more and improved fire-fighting equipment used by more thoroughly trained personnel, and the development of public campgrounds and lunch stops along the highways contributed to early detection of over 50 per cent of the fires. Fire-fighting costs totalled \$24,602.

Timber cutting continued at the same volume as in 1959.

Mackenzie District and Wood Buffalo National Park

Ninety-two known fires burned 101,682 acres compared to eighty-five fires and 110,845 acres in 1959. Seventy-five per cent of the fires in 1960 were caused by lightning. Early detection and attack by airborne crews again

proved their worth particularly on fires in the more valuable stands of timber in Wood Buffalo National Park. Fire-fighting costs amounted to \$55,293.

About the same volume of timber as in 1959 was cut in the Mackenzie District and Wood Buffalo National Park. However, since most of the lumber from Wood Buffalo Park is sold on markets outside the Territories, increased production will depend upon demand.

Oil and Gas—Northwest Territories and Yukon Territory

Oil and gas permits were issued for nearly 40,000,000 acres of potential oil land in the Arctic Islands and 4,000,000 acres of land on the continental shelf off Sable Island, Queen Charlotte Islands, and Mackenzie Delta.

The Territorial Oil and Gas Regulations were amended and promulgated as the Canada Oil and Gas Regulations which are in turn being amended in consultation with the oil industry and the Canadian Petroleum Association.

Three public competitions were held covering 112 grid areas resulting in the issue of 67 oil and gas exploratory permits.

Revenue

Revenue received for 1960-61 is as follows: Northwest Territories, \$1,836,797.29; Yukon Territory, \$5,915.91.

The revenue includes \$175,981.00 representing the government's share and royalty received from the operation of the Norman Wells oil field.

Exploratory Expenditures

Exploratory expenditures including well-drilling and geophysical surveys totalled over \$20,000,000, more than double that of 1959. The cumulative expenditure to date is over \$40,000,000. Between 30 per cent and 40 per cent of this figure is estimated to have been spent on building and clearing roads, bridging, cutting trails, and bringing in supplies.

Exploration Activities

During the winter, when trails and roads were passable, 16 seismic crews conducted geophysical exploration in the Northwest Territories and the Yukon. Surface geological surveys increased again during 1960. During the summer there were approximately 66 geological parties on the mainland and six on the Arctic Islands. Most of the Arctic Islands have been covered by photo-geological reconnaissance and detailed geological mapping is being conducted.

Of 31 exploratory wells drilled during 1960, 29 were dry and were abandoned and two are potential gas wells. Work on both has been suspended owing to lack of transportation facilities for gas. More wildcat wells were drilled to deeper horizons than during the past year, thus increasing the prospects of finding new horizons and new discoveries.

Oil and Gas in the Provinces

As the result of two public competitions for 16 parcels in Saskatchewan, 10 leases were issued for a total bonus of \$15,994.00.

Royalty was received from 9 wells in Manitoba, 8 in Saskatchewan, and 11 in Alberta.

Revenue received for 1960-61 totalled \$174,152.92.

Public Lands

Public lands administered by the Division comprise lands previously administered by other federal government departments, former Dominion Lands reserved from transfer to the western provinces which have reverted to departmental control when no longer required, and former Ordnance and Admiralty reserves. Under the Public Lands Grants Act and Regulations the lands are used in the general public interest and on a revenue producing basis when possible. Indexes of all lands and buildings under the administration of the department are maintained by the Public Lands Section, for submissions to the Crown Land Registry and for the Municipal Grants Division of the Department of Finance.

Five parcels of land were transferred to the Division by other Departments and one parcel was transferred to the Province of Saskatchewan. Nine sales, four assignments, and fifteen appraisals were carried out. Twenty-one agreements of sale, and seventy-seven leases are now in effect. Over fifteen hundred parcels of land will revert to the Department when no longer required by any other Government agencies. Eleven title searches were completed and the lands leased or sold. Replies were made to approximately 1,000 inquiries concerning land tenure, many from non-Canadians interested in settling in Canada.

Net revenue received for 1960-61 was \$43,162.43.

Dominion Land Records

Dominion Land Records cover the administration of lands, timber, mining and grazing rights in Western Canada, the railway belt and Peace River Block of British Columbia, between 1873 and 1930 when natural resources were transferred to the provinces. The records cover a broad range of subjects including school lands, colonization and soldier settlements, grants, Indian Reserves, National Parks, forestry sites, and other lands reserved for Federal Government purposes. Over 2,600 title deeds are registered and thousands of assignment or transfer documents are recorded.

One hundred and fourteen certified true copies of letters patent were prepared on request and 14,657 Hudson's Bay Company notifications and Manitoba and North Western Railway Company grants were indexed according to land description. Eleven historical research projects were completed, twenty-three title searches were carried out and approximately 830 inquiries dealt with concerning land dispositions, mineral rights and timber privileges.

Seed Grain Indebtedness

Between 1876 and 1925 the Federal Government provided advances for seed grain and fodder for livestock, and other relief to needy settlers in Canada in return for which liens were registered against their homesteads. All of the British Columbia and Manitoba liens have since been discharged. Advances for fodder and relief in the years 1919 to 1922 were shared between the Federal Government and the Governments of Saskatchewan and Alberta. On April 1, 1960 there were 419 federal and 240 joint federal-provincial accounts outstanding in Saskatchewan and 31 federal and 256 joint federal-provincial accounts in Alberta. In May 1960, Cabinet granted approval to discontinue negotiations for compromise settlements, and to cancel the federal share of outstanding indebtedness. Alberta and Saskatchewan concurred and agreed to cancel their 50 per cent share. An accelerated program of submissions to the Governor General in Council implemented by the Seed Grain Advisory Boards resulted by March 31, 1961 in the cancellation of 729 accounts, the writing off of \$136,036.77 in principal and \$308,508.35 in interest as loss by Order-in-Council and the discharge of 2,692 liens against the properties from the titles for the lands. By June 1961, it is expected that the remaining 218 seed grain accounts representing \$82,786.75 in principal and \$171,356.25 in interest will be cancelled.

Territorial Division

As an advisory service to the Commissioner, the Division dealt with such matters as game management, municipal affairs, labour legislation, workmen's compensation, health and vital statistics, taxation, liquor administration, professional and business licences, motor vehicle control, and other functions usually associated with a provincial secretary's department in a province.

The Game Ordinance was revised and consolidated to incorporate policy changes requested by the Council of the Northwest Territories. The following Ordinances were amended: Fur Export, Liquor, School, Insane Persons, Mining Safety, Motor Vehicles, Judicature, Pharmaceutical Chemist, and Municipal District.

The Council of the Northwest Territories met twice during the year, at Resolute and Ottawa. The Commissioner's annual report, published separately, gives a fuller review of territorial affairs.

Welfare Division

The Welfare Division provides welfare services to residents of the Northwest Territories on behalf of the Federal and Territorial Governments and to Eskimos in Arctic Quebec and Churchill, Man.

The Ottawa office comprises three sections: Family Services, Rehabilitation Services and Linguistic Services. Family Services encompasses public

assistance, child welfare, correction and medical services. Rehabilitation Services is concerned with the rehabilitation centres at Frobisher Bay, Rankin Inlet, and Inuvik. Linguistic services is responsible for translation of correspondence to and from the Eskimo language, prepares Eskimo publications, and is developing an Eskimo orthography.

Public Assistance

Family allowances have been paid in kind to Eskimos since 1947, but during the last four years payment by cheque has been introduced successfully in selected communities. As a safety factor families who prove unable to handle the cheques properly will continue on the voucher system as in the past, but by the summer of 1961 almost all of the \$22,000 now distributed monthly as family allowances to Eskimos will be paid by cheque. A relief policy which would have universal application to all racial groups in the North and a low cost housing program for indigents were developed.

Child Welfare

Care for dependent and neglected children in the Northwest Territories is administered by the Department on behalf of the Territorial Government. Children whose parents or guardians cannot care for them are placed in foster homes, boarding homes, or institutions depending on the child's needs and on available resources. Most settlements have foster homes and boarding homes. Children's receiving homes were operated in Churchill and Frobisher Bay. Plans were developed to open homes in Fort Smith and Yellowknife in 1961.

Preliminary steps were taken to revise the legislation relating to children. Plans include a new Child Welfare Ordinance to be presented to the Council of the Northwest Territories in July 1961. The new legislation will include adoption, maintenance, legitimization and protection of children. Standards in hostels both large and small were studied. Foster home placement and supervision procedures were reviewed and changes made where professional staff were available. An agreement was negotiated with the Province of Alberta for the training or custodial care of a maximum of 25 mentally retarded children from the North at either of two provincial institutions. The first children are scheduled to enter these homes in 1961.

Medical Social Services

Between 400 and 500 Eskimos were in hospital, mostly for tuberculosis, at any one time during the year. On discharge, Eskimo patients from sanatoria and hospitals received clothing and prosthetic appliances when required. Before a patient is discharged a study is made of conditions in his home. Medical social workers visiting hospitals regularly help patients maintain contact with their families through progress reports, taped messages, and photographs. In a year the Northern Welfare Service handled an average of

500 such reports and letters. When possible, Northern Patrol parties such as the Eastern Arctic Patrol include welfare staff who make immediate arrangements to avoid undue hardship or distress for members of a family separated by hospitalization.

Rehabilitation Services

Rehabilitation can be defined as the restoration to full usefulness of persons who are physically or psychologically disabled, culturally dislocated, or economically dependent. Northern Rehabilitation is, therefore, both remedial and preventive. The remedial program endeavours to restore to gainful employment those who have been disabled by illness. The preventive program assists outlying communities through relief projects, handicrafts, marketing, and education. Both aspects of Northern Rehabilitation reduce the incidence of illness, dependency, and disability resulting from poverty and ignorance.

Full community participation and close co-operation among agencies concerned with health, education, vocational training and economic development are essential to the program. It serves to associate people fully with their own development while bringing to bear on their problems a range of knowledge and skill.

Rehabilitation Centres

Rehabilitation Centres are available to all ethnic groups at Frobisher Bay, serving Baffin Island and Arctic Quebec; at Rankin Inlet, serving the district of Keewatin; and at Inuvik, serving the lower Mackenzie District. Each centre is a small village providing quarters for single persons, separate housing units for families, workshops and other facilities for projects. The layout is designed to give residents of the centre a controlled experience in community living and employment routines, thus providing a stepping stone from one cultural and economic milieu to another.

Community Assistance

Areas of community assistance to be examined when staff becomes available include the role of volunteer services in the North, emergency camp units, Eskimo Councils, and resettlement.

Linguistic Services

The linguistic services continued to develop a tentative standard Eskimo orthography using the Roman alphabet. Several groups of Eskimos, to whom this new method of writing their language has been introduced, have received it with enthusiasm. A preliminary booklet describing the method was published.

Translation from English into Eskimo was provided for the Branch, Indian and Northern Health Services, and the Canadian Broadcasting Corporation. Interpreters were provided for medical staff in sanatoria and in the field.

Several issues of the Eskimo language magazine *Inuktitut* were published with correspondence from all over the world commenting on the magazine and requesting copies.

National Parks Branch

The National Parks Branch is responsible for the preservation, administration and development of an adequate system of National Parks and National Historic Parks and Sites.

The organization of the Branch consists of the Director's office, which includes the Planning and Development Service, Education and Interpretation Service, Branch Administration, and four Divisions: the National Parks Service, the National Historic Sites Division, the Engineering Services Division, and the Canadian Wildlife Service.

Office of the Director of National Parks

The Planning and Development Service is responsible to the Director. Its function is to advise on policy relative to planning and development, to prepare long range development plans and to advise on pressing problems. The objective is to ensure that current projects are consistent with national parks purposes and that they fulfil present needs, as well as enhance the long range development of the national parks and historic sites.

During the past year extensive field surveys were carried out in the major parks. As a result of these surveys, plans and reports were produced on a number of urgent problems, and a considerable volume of material was gathered for the formulation of long range plans. Terms of reference were prepared for a consultant town planner subsequently engaged to draw up a long range plan for Banff Townsite. Special surveys also were conducted on general park use, use of boats in the parks, and on ski developments at Banff and Jasper.

The Education and Interpretation Service made considerable progress in promoting the education of visitors on the true concepts of the national parks. A new series of publications was prepared to cover each of the parks. Information folders for Banff, Waterton Lakes, and Fundy National Parks were in circulation by March 31, 1961. Issues descriptive of the other parks were distributed in 1961. This new series stresses the historical and basic functions of the national parks, with the emphasis placed on the preservation of the flora, fauna, and geological phenomena. Park employees received educational training at courses held in Banff in June and July. These classes were designed to give Information and Interpretation personnel a better understanding of, and a more knowledgeable approach to, the type of information which they should provide to park visitors.

Nature trails were developed in Banff, Georgian Bay, Jasper, Mount Revelstoke, Prince Albert, Riding Mountain, Terra Nova, and Waterton Lakes National Parks. Notes for self-guided tours of these trails were made available to visitors. Species of trees were identified and information on the shrubs, wildflowers, birds and mammals as well as geological features was

provided. Visitors who have taken advantage of these opportunities to commune with nature on these trails have expressed their pleasure at this new approach to the appreciation of the National Parks of Canada.

National Parks Service

An interesting development in administration of the national parks was the receipt of a report prepared under contract by the Institute of Local Government, Queen's University, Kingston, Ont., which reviewed aspects of the administration of some of the larger townsites in the national parks. The compilation of the report stemmed from representations made to the Department by concessionaires, chambers of commerce, and other organizations and individuals operating businesses in the national parks. The representations dealt specifically with matters involving rentals for the use of public lands in the parks, tenure of land occupancy, business licence fees, and the proposal that a measure of self-government be accorded residents of park townsites. The study was carried out during the summer of 1959 by Professor K. G. Crawford, Director of the Institute, and his associate, Dr. Stewart Fyfe. The officers undertaking the study consulted officials of the National Parks Branch both in Ottawa and in the field, and also had interviews with local groups in Banff, Jasper, and Waterton Lakes National Parks, including members of Advisory Councils of Banff and Waterton Lakes and the Jasper Chamber of Commerce.

Following intensive review of the recommendations contained in the report, agreement was reached by all parties concerned that it would be unnecessary to take any steps to establish what is usually meant by "local self-government". A number of the recommendations contained in the report have been implemented and others were still under study at the close of the fiscal year. Of particular interest was the recommendation that a qualified town planner be engaged to assist in the zoning and planning of park townsite development in collaboration with the National Parks Planning Section. Arrangements to enter into such an agreement are being implemented.

The report also stressed the desirability of organizing and supporting advisory councils in the major national park townsites and the holding of periodic meetings between members of the councils and senior officials of the National Parks Branch.

The National Parks of Canada continue to grow in popularity. During the fiscal year 1960-61, a total of 4,930,648 persons visited these areas. This represents an increase of 330,214 over the fiscal year 1959-60. It seems worthwhile to mention that with an increase of 97,939 persons, a total of 1,078,008 visitors entered Banff National Park. This was the first time that the million mark had been reached. Major increases in attendance of 83 and 67 per cent were recorded at Prince Edward Island and Cape Breton Highlands National Parks respectively. Substantial increases were also registered at Fundy, Jasper, Kootenay and Mount Revelstoke National Parks. These increases were all in excess of 22,000 persons.

The increased use of the parks is also reflected in the demand for space in public campgrounds, which are among the more popular attractions of the parks. During 1960, 349,195 persons were registered as campers at serviced campgrounds where attendants are on duty. This was an increase of 45,578 over the 1959 season. In addition, broad use was also made of the unserviced campgrounds, where no registration records are maintained. It is expected that the continued demand for camping facilities will necessitate further extension of existing camp-sites and the development of new ones.

Improvement of facilities for park visitors was made with the co-operation of private enterprise. In Banff National Park, 89 building permits were issued for a total construction value of \$1,042,951. The largest developments included a 50-unit motel, two apartment buildings and two business blocks. In Jasper National Park, 70 building permits were issued for a total construction value of \$569,954. The most noteworthy development was the construction of an ice-skating arena, equipped with an artificial ice-making plant. This was built as a community project through the efforts of the Jasper School Board. Building construction on a lesser scale was undertaken in the permanent townsites in other parks.

In a few of the national parks some land is held under freehold title. These lands were granted before the parks were established. The present policy is to acquire title to these lands as funds and opportunity permit. Considerable progress was made this year and purchases were completed in Banff, and Point Pelee National Parks. Several islands also were acquired as additions to Georgian Bay Islands National Park. In addition several leaseholds were extinguished where park lands were re-acquired by the Crown for park purposes. In all cases, satisfactory settlements were made with the former owners.

Maintenance work was carried out on scenic drives, trails, campground and picnic areas during the spring months and general maintenance undertaken throughout the year.

Provision was made in park appropriations for the continuation of the reconstruction of trunk highways:

The Banff-Jasper Highway (Banff and Jasper Parks)—Grading and the application of road mix from Miles 74 to 96.7 was 95 per cent complete; the bituminous base was completed from Miles 49 to 68; contracts for grading, base and prime, Miles 68 to 74 and 96 to 105 were 30 per cent and 40 per cent completed. Guide rail installation progressed favourably with 38,735 feet put in place.

The Banff-Windermere Highway (Kootenay National Park)—The 11-mile asphalt application contract from Miles 7 to 18 was completed with the exception of 7 miles of second lift; 30,000 feet of guide-rail was installed and given one coat of white paint; reseeding the right-of-way and slopes continued with the section between Kootenay Crossing and Vermilion Crossing completed; 8 miles of fringe clearing was completed between Miles 18 to 28.

The Cabot Trail (Cape Breton Highlands National Park)—Paving from Miles 15 to 29.5 was completed; reconstruction from Miles 29.5 to 33.5 was approximately 70 per cent completed with final grading and graveling remaining to be done; guide-rails were installed from Miles 15 to 29.3.

The Gulf Shore Road (Prince Edward Island National Park)—Paving from Dalway to Brackley was completed; the section between Rustico and New London was completed with the exception of the final lift; 1,000 feet of guide-rail was installed.

In addition to the projects for trunk highways, the Emerald Lake Road in Yoho National Park was reconstructed preparatory to asphalt paving, and construction continued on the Maligne Lake Road in Jasper National Park.

The Trans-Canada Highway was completely hard-surfaced in Mount Revelstoke National Park. Unfavourable weather in Glacier National Park slowed the construction considerably.

Other major projects included continuation of reconstruction of Banff Avenue in Banff National Park; continuation of development of the New London Campground in Prince Edward Island National Park; commencement of construction of a campground and trailer park at Broad Cove in Cape Breton Highlands National Park; improvements to the existing water distribution system and installation of a limited winter water system in Prince Albert National Park; continuation of construction of a campground at Point Wolfe in Fundy National Park; continuation of development of the new campground in Kootenay National Park, and continuation of construction of a new campground at Wasagaming Townsite in Riding Mountain National Park. Good progress was reported on all of these projects.

Development of Terra Nova National Park in Newfoundland was continued. Hard-surfacing of the Trans-Canada Highway through the park was completed. Construction of trails and access roads into the interior of the park was continued, together with the construction of visitor facilities at strategic locations. It is expected that Terra Nova National Park will be officially opened in the summer of 1961.

Supplementary estimates provided an additional \$2,819,235 for a winter works program in the national parks. This sum provided work for approximately 1,800 of the unemployed in Canada. Clearing new right-of-ways for highway purposes and fringe clearing along other roads was accomplished. A number of other projects were undertaken to increase and improve the visitor facilities in the national parks.

To conserve natural grazing areas, over-abundant wild animal populations were reduced in Banff, Elk Island, Prince Albert, and Riding Mountain National Parks. During the year 345 elk, 55 buffalo, 35 moose, 7 deer and 51 beaver were slaughtered. Most of the meat and hides were sent to the Northern Administration Branch of the Department, and the Indian Affairs Branch of the Department of Citizenship and Immigration, for distribution to

needy Eskimos and Indians. The pelts resulting from the reduction of the beaver population in Elk Island National Park were disposed of by public tender.

The forest fire season of 1960 was one of the most severe in recent years in the national parks in Alberta, British Columbia and the Atlantic Provinces. Restrictions on public travel in the less developed areas of the parks were imposed for periods varying from a few days to as much as two weeks.

Forest fire losses, while well above the average for the last five years, were held to acceptable limits in all parks. A total of 36 forest fires consumed 9,126 acres of national park lands. Direct costs of fire-fighting operations amounted to \$97,000. Of the 36 fires, lightning accounted for ten, seven were started by smokers, five from camp-fires and two were of incendiary origin. The remaining 12 started from a variety of human activities.

Park Wardens enjoyed opportunities for additional training in order to maintain the high standard of efficiency required to be fully effective in case of emergency. General training, mountain climbing and rescue and winter skiing and avalanche rescue schools were held in Banff for wardens in the Western Parks. A conference was held in Riding Mountain National Park for Chief Wardens in the Western Parks. A general training school was held in Cape Breton Highlands for wardens in the Eastern Parks.

Recreational facilities in the various parks were quite popular, with swimming pools, golf courses, tennis courts, bowling greens, and skiing facilities each having a share of visitor use. The various parks reported on activities involving bowling, golf, tennis, curling, and ski tournaments. The highlight of these events was the Canadian Junior Ski Championships which were held in Jasper National Park in February, 1961. This marked the first time that this event was held in a national park. It was sponsored by the Jasper Park Ski Club and the Canadian Amateur Ski Association.

Canadian Wildlife Service

Waterfowl breeding conditions and waterfowl populations were again studied in co-operation with all the provinces and territories and the U.S. Bureau of Sport Fisheries and Wildlife. Factors affecting the production and survival of some species of ducks were investigated in detail, and the problem of waterfowl damage to crops continued to receive attention.

A waterfowl-kill survey by mail was conducted in Quebec and New Brunswick. Waterfowl bag checks were also carried out in other provinces to obtain information on hunter success during the hunting season.

Spring counts of woodcock were made in the Eastern Provinces, and the status of the species was studied. The migration of snipe was studied in Eastern Canada during 1960, and the results of those studies will form the basis of continuing investigations.

Among the investigations undertaken was one dealing with waterfowl concentrations in the western Arctic. Ground investigations were carried out

in the Kendall Island and Anderson River breeding areas. Data were obtained on the breeding biology and food habits of, and predation on brant, snow geese, whistling swans, and white-fronted geese. Surveys were also carried out to determine best locations for needed Migratory Bird Sanctuaries in the western Arctic.

Organization of banding programs and participation in them were continued. A total of 129,040 records of banded birds was received and processed during 1960.

Administration of the Migratory Birds Convention Act was continued in conjunction with the Royal Canadian Mounted Police and in co-operation with the provincial game branches.

Three new Migratory Bird Sanctuaries were created during 1960, one in Quebec, one in Ontario, and one in the Northwest Territories. There are now 101 sanctuaries in Canada, with a total area of about 6,300 square miles.

Mammal research in the Mackenzie District was mainly concerned with studies of large species. Studies of muskrats in the Mackenzie Delta, and beaver and squirrels in Wood Buffalo National Park were continued. Physiological studies of caribou were continued at McGill University by an officer of the Service.

An intensive study of diseases and parasites in bison in Wood Buffalo National Park was continued and was complemented by a similar study in Elk Island National Park.

In the national parks of Western Canada investigations were continued on the biology and management of such big game species as elk, bighorn sheep, and goats. A special problem was posed by the forays made by elk onto agricultural lands adjacent to the parks.

On behalf of the Department of Forestry and with the co-operation of private interests, the foundation was laid for a study of the effects of small mammals on forest regeneration in Alberta.

Studies of the condition of caribou range in Northern Canada were continued with the objective of eventually being able to establish the carrying capacity of the range per unit area.

As an adjunct to other caribou studies an investigation of the biology of northern wolves was continued. The investigation will assess the effects of wolves upon caribou occupying the same ranges in Northern Canada. This research has been affected by the success of the wolf control program which has made wolves very difficult to obtain.

In the eastern Arctic studies of the biology of Arctic foxes were continued, and further surveys of caribou and muskoxen on the larger islands of the archipelago were undertaken.

Studies of the biology and numbers of polar bears in the Canadian Arctic in relation to utilization by the Eskimo population were instituted. Knowledge of the status of the polar bear in other countries bordering on the Arctic Ocean is being sought.

A study of the white-tailed deer was continued as a co-operative venture with the Province of Nova Scotia.

In the mountain parks, the fishery investigations were mainly centred around the splake trout studies. Substantial collections of specimens were made from most lakes containing the species, and it is hoped an evaluation of the species' success in park waters will be available soon.

Some time and effort was centred on the stocking of salmon in the Cascade River drainage and on the experimental use of Vibert egg boxes. Rainbow trout eggs were also planted in Banff and Waterton Lakes National Parks to test Vibert boxes. An attempt to ascertain the success of the plantings will be made in 1961.

Small experimental plants of golden trout eggs were made in virgin waters in Yoho, Kootenay, Banff, and Jasper National Parks. The species is especially adapted to high altitude lakes in California, where it originates, and if successful in park waters, it may become an added attraction to visiting anglers.

Two fish eradication projects were performed in the mountain parks in 1960. Honeymoon Lake in Jasper Park was poisoned and should be ready for stocking in the spring of 1961. Vista Lake in Banff was poisoned early in the year and restocked in the autumn. Moab and Emerald Lakes, poisoned in the autumn of 1959, may be ready for stocking in 1961. They were still toxic in 1960.

Attempts to collect cutthroat trout eggs at Marvel Lake met with limited success.

Weed control chemicals were tried at the Vermilion Lakes in Banff, Linnet Lake in Waterton, and Mildred Lake in Jasper. Results have not been completely evaluated, but indications are that at least one chemical shows promising results.

An experimental transfer of 2,000 yearling rainbow trout was made to Pine Lake in Wood Buffalo National Park, using the plastic bag method. It was estimated that no more than a 3 per cent loss was experienced. Trout spent 14½ hours in their crowded containers.

Yellow walleye eggs obtained from the Manitoba Fisheries Branch were hatched and released in Clear Lake, Riding Mountain National Park. Small mouth black bass obtained from Ontario and Quebec were released in Moon Lake. Autumn egg-taking activities at Clear Lake resulted in obtaining slightly over 400,000 trout eggs, of which approximately 70 per cent were fertilized to form splake eggs and the remainder lake trout. The majority of the eggs were shipped to Jasper for hatching. Work was continued on previously unsurveyed lakes and streams.

National Historic Sites Division

The National Historic Sites Division is responsible for the operation and maintenance of 22 national historic parks and major national historic sites, and for the care and preservation of 580 plaques and monuments erected since 1922.

Places, including buildings of national historic importance by reason of age or architectural design, are commemorated by the Minister under authority of the Historic Sites and Monuments Act (1-2 Eliz. II). The Minister is advised by the Historic Sites and Monuments Board of Canada—a group of 14 historians chosen from all the provinces.

In the year 1960-61, without slackening its acquisition program, the Division embarked on a new program designed to emphasize historical interpretation at the national historic parks and major sites. Period furnishings were acquired for the Maillou House in Quebec City, Sir Wilfrid Laurier's Birthplace at St. Lin, P.Q., and Woodside, Rt. Hon. W. L. Mackenzie King's boyhood home at Kitchener, Ont. Complete new museum exhibits were being organized at Batoche Rectory and Grand Pré National Historic Sites.

Major acquisitions during the year included the Palace Grand theatre in Dawson, Y.T., the Yukon stern-wheelers—the S.S. *Whitehorse*, S.S. *Klondike*, S.S. *Casca*, and S.S. *Keno* (all the gift of the White Pass & Yukon Route Company, Whitehorse, Y.T.), and Fisgard Lighthouse at Esquimalt, B.C.

Five commemorative plaques were unveiled.

Under supervision of the Engineering Services Division an extensive program of restoration was carried out. The Promenade des Gouverneurs at Quebec City was completed and opened on September 9th. In conjunction with the Quebec City Board of Trade, restoration of the 18th-century Maillou House at 17 St. Louis Street, Quebec City, was completed and opened on April 30th. In Halifax, renovation was started on the building and the mechanism of the Old Town Clock, and restoration was begun at Fort Charlotte on George Island. The restoration program at Halifax Citadel continued throughout the year, and restoration work was continued at Grand Pré memorial chapel and the powder magazine and sally ports at Fort Anne. Restoration of the walls of Fort Prince of Wales, at Churchill, was completed, and major restoration programs were started on Cabot Tower, Signal Hill, and on Port Royal Habitation.

The Historic Sites and Monuments Board of Canada held one general meeting. The Fur Trade Committee convened for a special meeting in September, in Edmonton. For these meetings the Research Section of the Division provided 30 historical briefs for the consideration of the Board. It also carried out extensive research to provide historical data on period furnishings and artifacts for the interpretation program, and architectural details for the use of the Engineering Services Division in restorations.

In 1959, the Division had been given administrative responsibility for the National Aviation Museum. With the National Research Council handling the interpretation, the Museum was successfully installed in the Ottawa International Air Terminal and officially opened on October 25th, 1960.

The Chief of the National Historic Sites Division attended the annual meeting of the Canadian Museums Association in Montreal, a Conference on Western Archaeology in Calgary, and a Conference on the Preservation

of Canada's Historical Resources, in Toronto. He also made tours of inspection covering almost all the national historic parks and major sites from the Yukon to Cape Breton.

Engineering Services Division

The Engineering Services Division was called upon for increased efforts to meet the demand for expansion and development in the National Parks and National Historic Parks.

The Architectural Section provided designs, plans, specifications and bills of material for all types of structures constructed in the National Parks and National Historic Parks. These projects varied in size from small service buildings in campgrounds to the industrial type of building in maintenance compounds and include houses, toilets, apartments, park gateway structures, information and administration buildings, warehouses and maintenance garages. In addition, the drawings for all private buildings proposed for construction in the parks were checked to ensure that they complied with good building standards and practices.

The Landscape Planning Section provided designs for campgrounds, trailer parks and picnic areas as well as ancillary furnishings connected with these areas. The Landscape Architects did some intensive design studies in campground planning owing to the increasing public demand for these facilities. This work produced new ideas in campground arrangement and confirmed the introductions of the past two years as definite improvements. One of these improvements, the cluster formation of camping units, was improved still further by increasing their flexibility, fitting them into an irregular site through a new arrangement of roads and access spurs to individual tenting plots, thus reducing the damage to the natural surroundings and simplifying the entry and exit of travel trailers to and from each unit.

New designs were provided for outdoor tables, benches, stools, grilles, council fire shelters, service unit, fire equipment containers and signs improving the appearance of these fixtures, also creating a character to fit suitably into a national park.

Preliminary planning studies were also made and sketches prepared showing proposals for revised road patterns to give adequate traffic control, distribution and circulation with separation of vehicles and pedestrians; grouping of buildings, zoning and population densities, recreation areas and playgrounds, marina installations, for the improvement and redevelopment of four national park communities.

Field investigations were carried out at several historic sites and preliminary plans produced showing proposed development. Most of the projects are situated in Ontario, Quebec, and the Atlantic Provinces. Studies on restoration work on historic sites were also carried out during the year.

The Engineering Section provided designs for structures erected in National Parks and National Historic Parks and Sites, and for water, sewerage

and electrical distribution systems, prepared and reviewed specifications for the purchase of equipment which include motor vehicles, construction equipment, tractors, shovels, graders and snow plows, performed duties of Resident Engineers, and gave engineering and technical assistance on all problems of this nature encountered by the Park Superintendent in the operation of national parks. The Supervising Engineers' offices, Banff, Alta.; Ottawa, Ont.; and Halifax, N.S., continued to offer supervision, engineering and technical advice on varied field projects carried out by day labour and contract basis.

The aerial survey and mapping program was continued in five eastern and three western parks during the year. The survey program was again carried out in connection with scenic and secondary road locations in sections of western parks in regard to future planning and development. Engineers supervised the following construction projects:

Construction of an entrance gateway, administration building, roadways, parking area and lighting, Point Pelee National Park;

Construction of street lighting and electrical power distribution system at Stanhope and New London Campgrounds, Prince Edward Island National Park;

Construction of a laundry and comfort station at Stanhope, standard shower and toilet buildings at New London Campground and a double garage at Cavendish Warden Station, all in Prince Edward Island National Park;

Construction of a limited winter water system, Waskesiu Townsite, Prince Albert National Park;

Construction of a warehouse at the work compound, Waterton Lakes National Park;

Winter grading and culvert work, Mount Revelstoke Road, Mount Revelstoke National Park;

Construction of a Park Superintendent's residence and three staff residences, Mount Revelstoke National Park, B.C.

Major restoration and other construction work at Halifax Citadel, Halifax, N.S.; Alexander Graham Bell Museum, Baddeck, N.S.; Port Royal, N.S.; Fort Beauséjour, N.B.; Martello Tower, Saint John, N.B.; the Quebec Citadel, Quebec, P.Q.; Fort Lennox, P.Q.; Fort Chambly, P.Q.; Fort Prince of Wales, Man.; and Lower Fort Garry, Man.

Water Resources Branch

The Water Resources Branch comprises two Divisions: Operations, which is responsible for most of the basic Branch functions, and Hydraulics, which is responsible for special studies required in the solution of waterway problems referred to the Branch. It carries out the systematic hydrometric survey throughout Canada, studies and analyses problems involving waterways of federal-provincial and international concern, compiles the water power resources inventory of Canada and administers legislation concerning international rivers, water power and water conservation.

The Branch co-operates with public and private agencies in water-power and water-supply problems, in the maintenance of gauging stations and in the performance of hydrometric surveys and investigations of mutual concern. The Director and senior engineers are active members of numerous federal-provincial and international engineering boards and boards of control established to deal with waterway problems. The Director is also a member of the Northern Canada Power Commission. As a part of a continuing hydrometric survey program, certain gauging stations of international interest are operated in co-operation with appropriate United States Government agencies.

During the year the Branch, either directly or through its representation on Federal-Provincial and International Boards, participated in a number of major investigations and study assignments. Location of the river systems involved in these assignments is indicated on the map which accompanies this report on Branch activities.

Hydrometric Surveys

Conduct of the systematic hydrometric survey program comprises a major part of the Branch activities. A large portion of the program is operated in co-operation with some 85 different organizations including various federal, provincial, municipal, and private agencies. Field operations of the Branch are carried out through six district offices and 17 sub-offices distributed across the country from Newfoundland to the Yukon Territory. During the year, 1,462 gauging stations were operated either entirely or in part by the Branch. Field operations included 9,720 stream discharge measurements and 2,429 additional inspections of gauging stations.

Water Resources Papers, containing records compiled from the operation of the hydrometric survey program, are published at intervals. Each of these papers covers one of the four main drainages of Canada, and, during the year, papers containing the hydrometric survey records obtained in water years 1955-56 and 1956-57 for the St. Lawrence and Southern Hudson Bay Drainage and in water years 1956-57 and 1957-58 for the Atlantic Drainage were issued.

The Current Meter Rating and Experimental Station located at Calgary was operated for the repair and calibration of current meters and related equipment and for the investigation of new types of instruments. Its services were available to other organizations.

Based upon the flow records from 24 typical rivers distributed across Canada, a monthly statement covering stream flow conditions in Canada was released to the public. The flow records were supplied to the United States Geological Survey which published a monthly summary of stream flow in North America.

During the period covered by this report, mean monthly flows generally were above normal in British Columbia and on the eastern slopes of the Rocky Mountains and varied from near normal to below normal in most other parts of the country.

On several rivers subject to dangerous floods, frequent observations of stage were obtained and a flood warning service was provided during periods of high flow. Water levels were obtained at 26 key locations in the Columbia River and Fraser River basins in British Columbia, at about 20 locations in the Saskatchewan River basin in Alberta and Saskatchewan, and to a smaller extent on certain rivers in some of the other provinces. From this information, together with a study of river conditions and current meteorological data, day-by-day computation of probable stages in the lower reaches of these rivers was made available to interested agencies.

The customary annual program of snow surveys was carried out in areas where this information is required to prepare estimates of the amount of spring runoff. This program supplements similar programs operated in different areas by other agencies. As part of a continuing program of biennial surveys of representative glaciers in British Columbia and Alberta, eight glaciers in these provinces were surveyed during the year.

Waterway Problems and Water Power Administration

Staff members served on twenty-two international and five federal-provincial boards and committees, which were established to study problems relating to the control of boundary or other waters. In addition, representatives served on or assisted in the work of seven miscellaneous national committees concerned with water resource development and related fields. The district offices assisted other federal agencies with engineering advice on specific water problems.

Technical advice was provided to the Department of External Affairs and to the Canadian Section of the International Joint Commission in their considerations and studies of international waterways problems which have arisen on a number of the rivers across Canada.

Among the important studies of this nature in which the Branch participated were those on the Columbia River. Numerous engineering investigations, hydraulic computations and power studies were conducted to meet the

WATER RESOURCES BRANCH

LEGEND

RIVER SYSTEMS INVOLVED IN MAJOR INVESTIGATION AND STUDY ASSIGNMENTS DURING FISCAL YEAR 1960-1961.

INTERNATIONAL

4. COLUMBIA
5. ST. MARY-MILK
7. SOURIS-RED
9. GREAT LAKES - ST. LAWRENCE
10. ST. CROIX

FEDERAL-PROVINCIAL

3. FRASER
6. PRAIRIE PROVINCES
8. LAKE OF THE WOODS - WINNIPEG
11. SAINT JOHN

FEDERAL

1. YUKON
2. MACKENZIE



CANADA
MAJOR INVESTIGATIONS AND STUDIES — 1960-1961

needs of the Department or of the various inter-departmental, federal-provincial, and international committees which were appointed by the governments concerned to determine answers to Columbia River development problems. Technical advice and assistance was provided to appropriate provincial authorities in connection with investigations and studies being conducted on a joint federal-provincial basis.

In this connection the Branch advised the Canadian representatives in the negotiations for international agreement on the all important problem of measuring and apportioning, between Canada and the United States, the downstream benefits in power production and flood control which would accrue in the United States from the use of storage projects located in British Columbia. The negotiations between Canada and the United States, guided by the results of the studies carried out by the various advisory committees led, in January 1961, to the signing of a Treaty between the two countries embodying agreement on a pattern of development for the Columbia River and the manner in which the benefits of development should be apportioned.

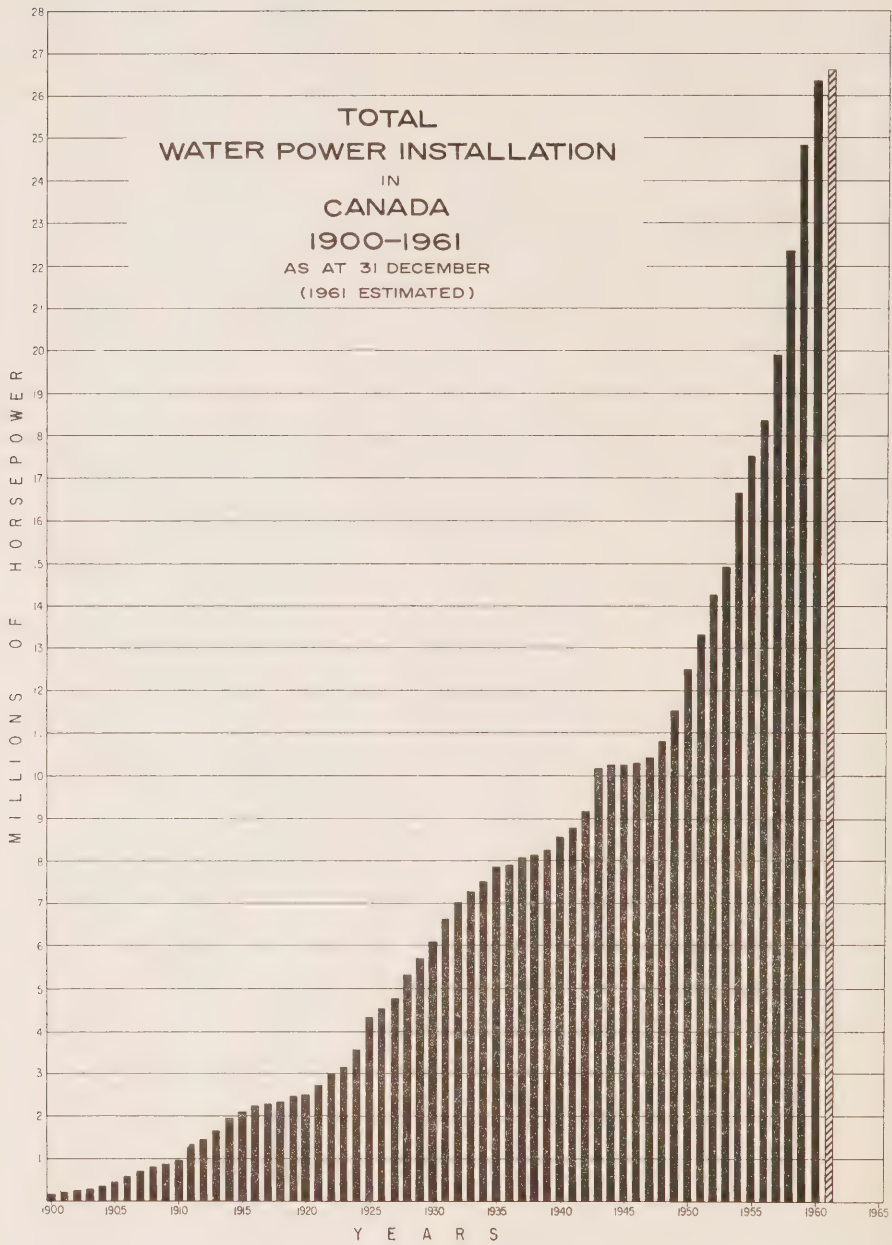
In connection with its representation on the International St. Lawrence River Board of Control, the Branch took a leading part in the application of regulatory measures designed to make the most effective use of storage on Lake Ontario for the operation of the St. Lawrence River power project in the International Rapids reach of that river and the seaway project from Lake Ontario downstream to Montreal. The Branch also participated in continuing studies to increase the effectiveness of storage on Lake Ontario.

Following a study of the report on the International Passamaquoddy Engineering Board, and taking into account the views of various interests as expressed at public hearings in April 1960, the International Joint Commission submitted its report on the Passamaquoddy Project to the Government of Canada in accordance with the Reference of August 1956.

As a result of the acceptance by the Governments of Canada and the United States of an International Joint Commission recommendation, further studies relating to the future development of the St. Croix River basin are being carried out by the International St. Croix River Engineering Board. At present these studies are largely concerned with pollution problems.

The International Souris-Red Rivers Engineering Board continued flood control studies on the Souris, Red, and Roseau Rivers, and was authorized by the International Joint Commission to undertake feasibility studies recommended as a preliminary step towards evolving a plan of development of the water resources of the Pembina River basin in Manitoba and North Dakota.

The Branch participated in studies carried out under the direction of the Saint John River Board. The Board was established in March 1959 by the Governments of Canada and New Brunswick for the purpose of determining how the present and future power developments in New Brunswick would be affected by the development and operation of storage on the upper Saint John River and its tributaries. The report embodying the findings of the Board was submitted to the Governments of Canada and New Brunswick in June 1960.



On the basis of a reconnaissance report outlining work and expenditure required to evaluate integrated basin development in the Saskatchewan-Nelson system, the Prairie Provinces Water Board submitted to the Governments of the Prairie Provinces and of Canada a resolution urging the implementation of a study designed to formulate an integrated development plan for the water resources of the Nelson River basin. The necessity for such a plan is indicated by the increasing competition in the basin for the use of the water resources for domestic, municipal, industrial, hydro-electric power, and other purposes.

Members of the Branch staff offered technical advice and co-operated with the Secretariat of the Advisory Committee on Water Use Policy in a number of its assignments.

The Yukon River has been the subject of previous study to determine the possibilities of diversion of its upper reaches into the Taku River system for power production in Northwestern British Columbia. Since the Canadian portion of the Yukon River with its tributaries lies almost wholly within the Yukon Territory, and hence is a federal responsibility, the Branch continued its power resources reconnaissance surveys, initiated in 1956. In 1959, similar surveys were initiated in the Mackenzie River basin, and these were continued during 1960. When this work has been completed, it will be possible to provide a reliable estimate of the power potential which might be developed within the respective river basins.

Through its Chief Hydraulic Engineer, as Chairman of the Sub-Committee on Hydrology of the Associate Committee on Geodesy and Geophysics of the National Research Council, the Branch participated in a symposium convened to provide an opportunity for Canadian researchers in evaporation to exchange information and views and to encourage the use by engineers, foresters, agriculturalists, meteorologists, and others, of the best methods available for dealing with evaporation.

An important function is the administration of the Dominion Water Power Regulations in regard to water power developments carried out on federal lands. An additional final licence was issued in respect of a power development in the Yukon Territory already operating under federal licence, and one final licence was renewed. Rentals were collected for each of the nine developments under federal licence totalling \$46,214.84, of which \$2,711.30 was collected for the National Parks Branch of this Department, and \$30,925.59 for the Indian Affairs Branch of the Department of Citizenship and Immigration.

The Branch carried out activities relating to its responsibilities for the administration of the International River Improvements Act and Regulations and the Canada Water Conservation Assistance Act. Annual reports detailing the Branch's activities in this respect are tabled in the House of Commons.

Based upon the Branch's hydrometric surveys, field investigations and other data, the current estimate of the water power resources of Canada is 66,203,000 hp. at ordinary six months flow. During 1960, a net total of

1,741,820 hp. of new capacity was added, bringing the total installed capacity of all water power developments in Canada to 26,375,444 hp. Construction at present under way is expected to yield approximately 243,000 hp. of new capacity in 1961 and an additional 4,500,000 hp. of new capacity within the next few years, with provision made for a further 1,000,000 hp. as required in subsequent years.

¹Five regular annual bulletins were issued during the year, three dealing with water power in Canada, one covering thermal-electric installations, and one outlining progress in electrical generation.

¹ See Appendix E.

National Museum of Canada

Natural History Branch

This Branch maintains national collections in the biological and geological sciences. In addition to gathering and preserving these collections and displaying representative material the staff carry out research on the classification and distribution of living and fossil plants and animals.

It had been hoped that prompt renovation of the space previously occupied by the National Gallery and the Geological Survey of Canada would make it possible to establish several new halls for exhibition and storage. However, pending a decision on how long the present building is to be occupied by the National Museum, the space has been used for temporary exhibitions, meetings and courses, and as offices and workshops. Detailed plans, as well as specimens and accessories, have been assembled, and will be used as soon as the additional halls are renovated.

Temporary exhibitions prepared by the Natural History Branch during the year consisted of a display of fluorescent and radioactive minerals, and a collection of live reptiles from Canada and abroad.

During the summer the Director spent some time with Museum field parties in British Columbia, and visited the Saskatchewan Museum of Natural History and the Manitoba Museum. He represented the National Museum at the annual meetings of the Directors of Systematic Collections, the Canadian Museums Association, the Royal Society of Canada and the Canadian National Commission for UNESCO.

Botany

The Botany Section of the Museum constitutes the National Herbarium of Canada. Staff members carry out field work and research in plant taxonomy and regional distribution. Field parties this year studied vascular plants along the Alaska Highway, in the National Parks of the Rocky Mountains, and in southwestern and western Ontario, and on the mosses of the Gaspé Peninsula. Current research in botany includes studies on the arctic and alpine floras of Canada, on the floras of southern Canada from Newfoundland to Ontario, on the flora of the boreal forest zone, and on the mosses of Eastern Canada. Reports have been completed for publication on floras from the Mackenzie River Valley, and from the Liard Hot Springs area, and a revision has been made of the check list of boreal forest plants.

During the year the National Herbarium collection was increased by 22,435 specimens, of which 6,081 were received by exchange, 1,785 as donations, and 14,569 from staff field work or in return for identification.

Loans of specimens to other botanists totalled 1,852, and 1,019 specimens were borrowed from other collections for study at the Museum. Under the regular policy of distributing duplicates, 6,515 specimens were sent to other herbaria. Mounted specimens of vascular plants added to the collection numbered 5,047, making a total of 265,728 vascular plants. Corresponding figures for the cryptogams are: 6,048 packeted specimens added; total number of cryptogams, 96,046. The collection of type specimens was increased by 8, making a total of 1,819 types. Some 28 professional botanists visited the National Herbarium to study specimens, some such visits being for extended periods.

Zoology

The addition of a herpetologist to the staff of the Zoology Section, and the filling of the vacant position of mammalogist, has provided a well-balanced covering of the major groups of Canadian animals except insects, which are the responsibility of the Departments of Agriculture and Forestry.

During the summer eight expeditions studied and collected animals in the field. Subjects for investigation were the mammals, birds and amphibians of southwestern Ontario; the birds of Labrador, Saskatchewan, and Keewatin; the reptiles and amphibians of southern Manitoba; the fishes of the Beaufort Sea; the shallow-water invertebrates of the Gulf of St. Lawrence, and the molluscs of the Maritime Provinces and of northern Ontario and adjacent Quebec. Early in the year a member of the Zoology Section participated by invitation in a marine biology expedition to Yucatan, sponsored by the United States National Museum.

Major research fields currently under investigation are the mammals of Canada, the birds of Canada, the reptiles and amphibians of the Canadian prairies, the fishes of Canada, the marine invertebrates of the Atlantic and Pacific Coasts, and the molluscs of the St. Lawrence-Hudson Bay divide. A number of short reports and papers have been completed on topics within these fields. Major contributions completed during the year were a revision of the caribou and reindeer, a review of the abyssal molluscs of the world, and a report on the fauna of Ellef Ringnes Island.

Popular interest in the animals of Canada, especially birds, results in much of the zoologists' time being spent in answering inquiries by correspondence, telephone, and personal interview. In addition to this service the Zoology Section provides specimens for loan to schools. During the year these loans consisted of 190 mammal specimens, 388 birds and 14 reptiles and amphibians. Another special task has been the gathering of specimens and the collaboration in the designs for the large habitat groups of birds and mammals.

Members of the Zoology Section attended the following meetings as representatives of the Museum: American Society of Mammalogists, American Ornithologists' Union, Canadian Amphibian and Reptile Conservation Society, American Malacological Union, and the Canadian Museums Association.

The following figures show the increase in the number of specimens in the zoological collections during the year and their present total numbers: molluscs and branchiopods, 12,200 additions, total of 226,700; other invertebrates, 80,100 additions, total of 199,600; fishes, 2,500 additions, total of 17,385; amphibians and reptiles, 5,472 additions, total of 22,572; birds, 665 additions, total of 48,000; mammals, 783 additions, total of 28,283. Loans of specimens to schools totalled 541. The number of professional zoologists from outside of Ottawa who used the collections during the year was 32, and interested non-professionals, eight.

Palaeontology

Two fossil-collecting expeditions were in the field during the summer, one to visit certain fossil-fish and dinosaur localities in Alberta, the other to investigate the possibility of finding fossil bones in the red beds of Prince Edward Island. The latter resulted in some small but significant discoveries that justify further exploration.

The Chief Palaeontologist continued his studies of a Cretaceous vertebrate fauna from southwestern Alberta, and his monograph on the fossil crocodiles of South America. Two shorter studies were completed, one on a dinosaur footprint from Alberta, the other on a peculiar fossil shark from the Rocky Mountains.

Many specimens of fossil vertebrates were identified on request, including a large series collected by members of the Geological Survey of Canada. The Chief Palaeontologist represented the Museum at the annual meeting of the Society of Vertebrate Palaeontology.

Work in the laboratory has continued on the preparation of fossil skeletons for exhibition in the proposed new Hall of Fossils. The skeleton of the late Cretaceous plesiosaur *Elasmosaurus* has been completed, and work is nearing completion on the flesh-eating dinosaur *Gorgosaurus*. Preparation of the duck-billed dinosaur *Hypacrosaurus* is continuing, as well as the dinosaur skeleton for the Drumheller and District Museum, Alberta.

At the close of the year the total number of catalogued fossil vertebrates in the Museum collection was 4,862.

Human History Branch

This is the museum of Man, containing the national collections in the anthropological sciences: physical anthropology, archaeology, ethnology, linguistics, folklore and folk-music. Because ethnology and folklore merge into social history, the Branch also has large collections of furniture, utensils, and ornaments illustrating the development of arts and crafts among the Canadian settlers of French, English, and other non-aboriginal origin. Such material might form the basis of a section, or a separate museum, of Canadian history. With the exception of this historical material, all of the collections

are used in an active program of research, not only by the staff of the Branch, but also by a number of workers from other institutions, employed under contract.

The renovation of the newly acquired exhibition and storage space in the Museum building has been delayed. Plans for long-term utilization are well advanced, and meanwhile the space has been used in part for temporary exhibitions, illustrating such topics as spinning and weaving, antique Christmas cards, Mexican architecture, and Indian and Eskimo water-craft.

During the summer the Acting Director participated briefly in the archaeological survey of the South Saskatchewan River reservoir area, and visited an archaeological field party at an important site in the Fraser River canyon of British Columbia. Visits were also made to the National Museum exhibition of West Coast Indian Art at Stratford, Ont., and to the Maritime Museum in Vancouver. Exploratory trips were undertaken to determine the availability of material for historical displays in connection with the 1967 Centennial celebrations.

Archaeology

Field work in physical anthropology, which is grouped under archaeology, involved a co-operative excavation with the University of Toronto in Bruce County, Ont., and a survey of the prehistoric human remains in Canadian museums and universities.

Resumption of the Museum's program of archaeological field work in Ontario got well under way with the investigation of sites in Bruce County, and in western Ontario from Sault Ste. Marie to the Manitoba boundary. In Quebec some sites were explored in the vicinity of Henryville, near the U.S. border, and in collaboration with McGill University, in the Tadoussac area. The Museum resumed archaeological field work in the Maritime Provinces with a survey of southeastern New Brunswick. In Western Canada the survey of the South Saskatchewan River reservoir area was continued in co-operation with the Saskatchewan Museum of Natural History. A very detailed excavation of stratified sites in southwestern Yukon Territory revealed evidence of early occupation. Some sites on the west coast of Vancouver Island were explored. Archaeologists working under contract continued the excavation of the stratified site in the Fraser River canyon near Yale, B.C., and explored Pre-Dorset sites on Juet Island, off the south coast of Baffin Island.

While on leave of absence the Senior Archaeologist continued his studies of early agricultural developments in central Mexico.

The research program of the Archaeology Section may be grouped under the following general topics: Dorset and Pre-Dorset cultures of the Canadian Arctic; early occupations of Yukon Territory and British Columbia; archaeology of the Prairies and of western and central Ontario; archaeological resources of the Maritime Provinces; anatomical and physiological characteristics of Canadian aboriginal peoples, especially the Eskimos and their predecessors. Within these major projects, the following studies were completed

during the year: Pre-Dorset sites at Ivugivik; archaeological survey of northern Quebec and Labrador; survey of archaeological sites, north shore of Lake Superior; archaeology of Manitoba mounds; Eskimo dental morphology; Dorset and Eskimo skeletal material from Sugluk and Mansel Islands.

Staff members represented the Museum at the annual meetings of the Society for American Archaeology, the American Association of Physical Anthropology, the Eastern States Archaeological Federation, the American Anthropological Association, and a special meeting of the Western Canada Archaeological Conference.

During the year, 21,251 catalogued artifacts were added to the collection, making a total of 131,231 specimens. In physical anthropology, eleven specimens brought the total of catalogued material to 1,511. Not all of the collections made in 1960 were catalogued before the close of the fiscal year.

Ethnology

Additions to the staff of the Ethnology Section included a musicologist and a linguist, permitting an expansion of the Museum program in folk-music and a resumption of the important study of aboriginal languages.

Field work consisted of studies on the Malecite Indians of New Brunswick, on the building of an umiak by the Eskimos of Ivugivik, Que., on the linguistics of Micmac Indians of Nova Scotia, on the folklore of Acadian communities in the Atlantic Provinces, with observations on St. Pierre and Miquelon, and on the instrumental folk-music of southwestern Ontario. Staff members planned and supervised a number of projects carried out by other persons working under contract. These investigations were: Micmac Indians of New Brunswick; Naskapi Indians of Labrador; Montagnais-Naskapi Indians of the North Shore, Quebec; intra-tribal organization of the Iroquois of Ontario; traditions of the Ojibwa Indians, north shore of Lake Superior; Ojibwa Indians of southwestern Manitoba; changing social relationships of the Plains Indians; linguistics of the Abenaki Indians of Quebec; linguistics and folklore of the Micmac Indians of Gaspé; folk-music of Newfoundland; Acadian folklore of New Brunswick; folklore of North Shore of Quebec; French-Canadian material culture of Quebec.

Members of the Ethnology Section represented the Museum at the following meetings: 6th International Congress of Anthropological and Ethnological Sciences, 34th Congress of Americanists, meetings of the Canadian Folk Music Society, annual meeting of the Anthropology and Sociology Section of the Canadian Political Science Association.

The ethnological and historical collections were increased by 1,112 catalogued specimens, making a total of 24,951. Tape recordings of folklore and folk-music, 1,448 in number, brought the collection up to a total of 18,568.

Canadian War Museum

The Canadian War Museum is concerned with the collection, preservation, and display of objects related to the military history of Canada and other countries of the world.

The staff of the Museum was concerned during the summer and autumn of 1960 with the detailed examination of the Douglas Collection of the Royal Military College of Canada. A special exhibit was prepared and displayed during the opening of the new Royal Military College Library. The Douglas Collection consists of over 400 items, mostly of a military nature, such as muskets, swords, and armour. These items come from the four corners of the world and in some cases date back to the 15th Century.

The re-cataloguing of the Museum trophies started in 1959 is progressing. During the past year 1,095 different types of pistols, bayonets, and light and medium machine guns have been examined, identified, and refurbished where necessary.

The number of specimens added to the collection was 179. Loans made to other museums, educational institutions, and for special exhibits totalled 110. Conducted tours were provided for 375 groups, a total of 10,236 individuals, mainly from schools, colleges, and the Armed Forces. Total attendance for the year was 136,901.

Common Services

Both Branches of the National Museum are served by the Education, Museology, Library, Photography, and Mechanical Sections. An Assistant Director was appointed to supervise the interpretative program of the Museum, carried out by the Education and Museology Sections. Administration and research remain the direct concern of the Director.

The Education Section arranges public lectures, film showings, and guided tours, works with school classes and visiting groups, distributes publications, photographs, film strips, lantern slides and motion pictures, and operates the sales desk. The Section has the custody of a large collection of half-tones and line cuts. In collaboration with the scientific sections it arranges loans of specimens to schools.

The regular Museum Wednesday Evening Lecture Series consisted of 18 lectures in English, with an average attendance of 370. On several occasions the total seating capacity of the lecture hall, 600, was used, and many persons turned away. Innovations this year consisted of a presentation of 17th and 18th Century chamber music, and a performance by a group of Ukrainian folk singers and dancers. In addition to the regular lectures, four special presentations in English, some on the history of popular music, drew an average attendance of 450. The Saturday morning children's program consisted of 21 presentations, mostly of educational motion pictures. Each of these was given at least twice, and the total attendance of the series was

25,337, or a capacity house for each showing. Efforts to establish a French-language lecture series continued. Two lectures and two motion pictures in French were presented, to a total audience of 347 persons.

The experiment with children's art classes, started last year, was continued with even greater success. These classes provided instruction in the techniques of drawing, painting, and modelling, from professional instructors, but the primary purpose was to stimulate observation and interpretation of the objects in the Museum.

The Ottawa Public Schools continued to use Museum facilities for Grade 7 classes. Each Thursday, for 14 weeks, five different Grade 7 classes visited the Museum for a lesson on Indians or on a natural history subject. Other organized groups receiving instruction or guidance totalled 122, of which 23 were French-speaking. A total of 4,348 persons were given this service.

Loans of motion pictures to schools and other groups totalled 95; there were a few loans of film strips, photographs, or nature recordings. Steps were taken to organize the Museum's collection of coloured transparencies so that sets of 2- by 2-inch slides may be available for loan or purchase. At present a set of 100 slides illustrating Canadian birds can be supplied.

The facilities of the Museum are available to educational or cultural organizations for lectures, film showings, classes, or meetings. Thirty-five groups used the lecture hall during the year. Special facilities for classes were made available to the Ottawa Field-Naturalists' Club, the Ottawa Valley Mineral Association, and the Ottawa Valley Weavers' Guild.

The projection equipment, which can accommodate all the standard types of lantern slides and motion pictures, has been renovated, and is being augmented by provision for use of magnetic sound track and cinemascope screen.

The appointment of a designer of museum exhibits under the title of Museologist has permitted the organization of a Museology Section, consisting of the chief, three artists, and a display technician. The function of this group is to prepare, in collaboration with the scientific and mechanical staff, the designs for all exhibits and exhibitions, and aided by the mechanical staff, to install these displays. Plans for the revised exhibition halls have been under study by this group, and three large habitat groups of birds are now in preparation. In addition to the six temporary exhibitions the Museology Section prepared special exhibits on the following topics: poison ivy and ragweed, the national days of New Zealand and Eire, and the mace of the Northwest Territories.

The approximate number of volumes in the Library as of March 31 was 44,700. It has been difficult with a small staff to make progress in the renovation of the Library while carrying on the routine duties of ordering, cataloguing, issuing, and locating references. The Librarian represented the Museum at the annual meeting of the Special Libraries Association, and the joint meeting of the Canadian Library Association and American Library Association.

The Photography Section became fully functional during the year, carrying out all requirements for printing and enlarging, and with the aid of new equipment, preparing negatives of specimens and drawings. A total of 10,287 pieces were handled. The negative collection of the Geological Survey is still under the care of the Museum.

The Mechanical Section provided cases, supports, and other furnishings for exhibits, particularly the fittings for the new bird habitat groups. Studies were carried out on new types of exhibition accessories, materials, and means of lighting. Experiments in the use of various plastics as exhibit materials were tried. The Chief of the Section visited the United States National Museum to observe the methods and materials being used in the new exhibition halls there. A very large task was undertaken by the Chief and the Draftsman to provide detailed plans and specifications for the proposed exhibition halls, storage rooms, and workshops, to be used by the Department of Public Works in carrying out the renovations. Liaison with officers of that Department has helped to make the Museum's requirements better understood. Projects completed by the Mechanical Section during the year numbered 331.

Canadian Government Travel Bureau

Value of Canada's Tourist Industry

Travel earnings of \$417 million in 1960 have dramatically changed the status of Canada's tourist industry as an export commodity, jumping it from third place in 1959 to second place in 1960, surpassed only by newsprint (\$757.9 million). It moved ahead of wheat (\$410.5 million), the second export earner in 1959, and far ahead of wood-pulp (\$325.1 million), aluminum (\$269.4 million), and nickel (\$258.3 million). During each of the past twelve years travel earnings have accounted for almost six per cent of Canada's current income on the Balance of International Payments Account.

Preliminary estimates by the Dominion Bureau of Statistics indicate that total expenditures of \$417 million in Canada by travellers from all countries during 1960 was \$26 million higher than 1959. United States residents spent \$371 million in Canada, *an increase* of \$20 million. Receipts from visitors from overseas countries also moved upward \$6 million to a new mark of \$46 million in 1960. Canadians travelling to other countries spent \$632 million, \$34 million more than in 1959. This included \$450 million spent in the United States and \$182 million in overseas countries.

There were some 29.7 million individual entries into Canada in 1960, a small decrease from 1959. On the other hand, Canadians went visiting a million more times than the 28 million recorded in 1959.

Role of the Canadian Government Travel Bureau

The Canadian Government Travel Bureau continued to play its role of a leader in encouraging the growth of Canada's tourist industry. Its Ottawa headquarters received three-quarters of a million inquiries from around the world about Canadian travel. It continued to encourage greater co-ordination of Canada's efforts in the international travel market at the annual Federal-Provincial Tourist Conference, which it sponsors, and took an increasingly active part in national and international travel organizations.

As a result of legislation enacted by Parliament in the autumn of 1960 tourist operators may now borrow funds from chartered banks for the expansion and improvement of their tourist facilities and services.

In the summer of 1960 the Director of the Canadian Government Travel Bureau visited Europe to explore the possibilities of increasing tourist traffic from Europe to Canada. In the course of his trip the Director visited ten countries and 15 major European cities. Conferences were held with Canadian Embassy officials, officers of Canadian transportation companies, travel agents, agents-general for Canadian provinces and the foreign directors of national travel offices.

Travel Bureau Activities in the United States Market

In undertaking promotion in Canada's main travel market—United States—the major efforts of the Bureau were concentrated in the fields of advertising and publicity which have proved to be the most productive.

Advertisements were placed in some 60 magazines and 97 newspapers, with an aggregate circulation of about 141 million. For the 1960-61 fiscal year the advertising appropriation was almost \$1.6 million.

In 1960, the Bureau used a new theme in its advertising approach—the Trans-Canada Highway. The highway has now reached the stage of near completion which permits the Bureau to feature it as a major attraction.

The special Atlantic Provinces Campaign, inaugurated in 1957, has been credited with a yearly increase of 10 to 20 per cent in tourist traffic into these provinces.

The Travel Bureau's field offices in New York City and Chicago handled nearly 100,000 inquiries. The Bureau opened a new office in San Francisco in July 1961.

The function of these field offices is to supply Canadian travel information in their immediate areas, maintain liaison with individuals and agencies engaged in travel service and promotion in the United States and promote travel to Canada through free publicity in U.S. media.

Other Media of Advertising, Promotion and Publicity

As a step to intensify and extend the Travel Bureau's advertising efforts in the United States in 1960 a spectacular electronic sign in Times Square was rented for 13 weeks. Thirty feet (two storeys) high and 32 feet long, this animated sign is located at 36th Street and Broadway. The New York Office recorded an increase of more than 40 per cent in inquiries the first month the sign was used.

Canadian travel and wildlife films were distributed in the United States in co-operation with the National Film Board of Canada, the provincial travel bureaus and the major transportation companies. In the 1960-61 fiscal year, expenditures by the Bureau will reach some \$135,000.

The Canadian Travel Libraries were enlarged thereby opening new avenues of distribution. The Travel Bureau's contribution of 883 prints represents 56.7 per cent of the total supply.

A total of 560 outlets served as distribution points throughout the United States for the 6,091 prints of the 172 titles available. Progressive withdrawal of four titles and 749 worn out prints was accomplished as new prints became available. New outlets continued to be established and the existing ones were reviewed with the aim of bringing them more in line with actual distribution potential in particular areas.

Direct screenings of films in the U.S.A. rose to a new high of 110,752—an increase of 11.96 per cent over the previous year. Audiences totalled nearly 6 million.

In conjunction with its Travel and Wildlife Film Program the Bureau provided prints free for television broadcasting through a library maintained by the National Film Board in New York City. As of December 1960 there were 651 prints of 67 titles available from this library.

Recorded telecasts for the year totalled 2,540 of which 298 were in colour, and these represented an increase of 37.1 per cent in telecasts over the previous year. This increase resulted largely from the use of the Television Brochure which offered stations a package series of 13 fifteen-minute travel films.

One of the most successful ventures into television film broadcasting has been the two-to-three minute shorts or "televisits". It is estimated that there have been 4,000 telecasts of the Bureau's 20 televisit subjects. In 1960, a further series of nine televisit titles was commissioned and these were in distribution by the summer of 1961.

Public Relations

Up to this year the Bureau has conducted most of its public relations through its publicity section in Ottawa, and through the managers of the New York and Chicago Offices. The director also maintains direct contact with major publications in the United States.

For several years the Bureau has studied ways of enlarging this public relations program to meet the competition from other nations, many of which spend large amounts to favourably influence editors, writers and travel officials who can greatly affect the flow of tourists. The Bureau proposes to extend business courtesies and hospitality to these officials on the same scale as other countries and certain Canadian provinces.

Early in 1961 the Bureau stepped up its activities in this field and invited to Canada travel editors of a number of major United States newspapers with a combined readership in excess of 9 million. These editors came to Canada individually and spent up to eight days visiting Montreal, Quebec City and the Laurentian and Collingwood areas.

The Bureau also commissioned lecturers to show films and deliver talks on Canada in the major centres of the United States. The Bureau proposes to expand this program in future years. Publicity activities in 1960 were concentrated on providing feature stories on request, supplying special articles to selected newspapers and assisting editors and writers in the preparation of articles and news-features on Canadian travel. Feature picture stories prepared during the year included: *Winter Holiday in Canada*, *Camping in Canada's National Parks*, *Trans-Canada Vacation Attractions*, and *Canada—White Wonderland*. A total of 312 requests were filled with these features.

A total of 1,339 illustrated articles were prepared for weekend travel sections in specific United States newspapers.

More than 15,000 black and white photographs were distributed to newspapers, magazines and other publicity outlets. Colour transparencies out on loan totalled 1,459.

The Bureau's photographic library added 4,401 black and white photos and 4,878 colour transparencies as a result of an extensive photographic program.

Overseas Activities

The Bureau continued to increase its distribution of publications and publicity material to overseas countries. This program was effected in co-operation with the Departments of External Affairs, Citizenship and Immigration, and Trade and Commerce, and with main transportation companies.

More than 101,000 pieces of literature and over 6,000 posters were disseminated through these outlets abroad during 1960.

Membership in Foreign and National Travel Associations

The Bureau is affiliated with three international travel organizations—the *International Union of Official Travel Organizations*, the *American Society of Travel Agents*, the *National Association of Travel Organizations* and one national association—the *Canadian Tourist Association*.

IUOTO is an organization of 77 nations and is the most respected international travel body in the world. The Director was elected to one of the two Vice-Presidencies of IUOTO for 1961.

ASTA presents a unique opportunity to promote Canada's travel industry through some 3,000 travel agencies.

NATO is composed of leading travel officials in the United States and Canada and through valuable research and information provided by their National Headquarters the Bureau is able to keep abreast of current trends and developments.

The Bureau gives financial support to the CTA and supports its campaign "Know Canada Better", and its efforts to promote interprovincial travel.

Travel Information Services

During the year the Ottawa office serviced close to 700,000 inquiries of which some 250,000 required special attention by the Travel Counselling Unit. This is the largest volume of inquiries handled by any national travel organization in the world.

A total of 37 booklets, folders, posters and maps including an all-new prestige booklet *Adventure along the Trans-Canada Highway* and a considerably improved edition of *Invitation to Canada* were published in the fiscal year. In addition, the Bureau produced two new posters and four new colour folders for distribution in 1961. Posters include *Summer Fun In Canada* and *See Canada This Year* while folders are entitled *A Canadian Honeymoon*, *What to See from Sea to Sea in Canada*, *Fishing in Canada* and *Canada's Vacation Weather*.

Currency Exchange and Customs Exemption Program

The Bureau distributes in the United States well over one million copies annually of its *Border Crossing Information* folder which includes detailed paragraphs explaining the exchange situation, customs exemption and other helpful information. In addition, more than 400,000 currency leaflets and nearly 24,000 posters urging the use of Canadian currency in Canada were displayed to the United States travellers at such places as customs ports of entry, hotels, motels, restaurants and department stores. A special poster outlining customs exemption on purchases by United States residents was also displayed widely in these same areas.

Distribution

New mailing procedures and service equipment were installed in the Distribution Unit to expedite the flow and handling in 1960 of nearly six million publications and posters—almost 800 tons of material.

Research and Statistics

A total of 664,000 responses in the form of coupons from advertisements and letters of inquiry were processed to provide up-to-the-minute tabulations of media responses. This procedure is of increasing value in planning and executing advertising campaigns.

The past year also saw a broadening of the tourist motivation studies which were instituted in 1959. In each year 140,000 respondents to the Bureau's advertising were sent a questionnaire to determine their travel habits in Canada. Approximately 23,000 responses were received in each of the past two years.

Administration Services

During the year under review the office of the Chief Administrative Officer and the five divisions served the Deputy Minister and the Department generally, and assisted the Branches with administrative and technical services.

Economic Division

The primary function of the Economic Division is to carry out economic research and to provide advice on economic questions relating to the Department's role in administering and developing the northern territories, and in the management of resources generally.

The Division's inquiries and advice range across the entire area of departmental activity. As in past years, economic considerations relating to transportation, mining and energy held primary positions in the Division's work. Economic studies of territorial revenues and expenditures, of processing and marketing of resources, on water power, forest operations and other renewable resource development, and on tourism were undertaken also as circumstances required.

Among its specific projects, the Division performed analytical work related to the territorial development roads program, to the Great Slave Lake Railway, and to the disposition of the Canol pipelines. It also made an economic evaluation of the Haines Highway from Haines, Alaska, to Haines Junction, Y.T.

The Division provided consultation on matters of both policy and substance. Members of its staff represented the Department on a number of interdepartmental and special committees which met during the year.

Editorial and Information Division

This Division provides a centralized editorial and information service for the Department and for individual Branches.

During the fiscal year, there was a large increase in the number of publications printed. A total of 232 individual publications—most of them of a technical nature—were printed, compared to 149 in the previous year. This total includes the publications of the Department of Forestry, which continued to be served by this Division during the year.

Information activities included the preparation and distribution of 133 press releases and 141 speeches and special articles. About 12,000 letters

from members of the public inquiring about subjects relating to the administrative area of the Department were received and answered, 40,000 pieces of mimeographed information literature or publications being distributed to answer these as well as other requests.

Duplication work was done for various departmental offices. This work and the Division's own requirements entailed the preparation of 3,564 stencils and the use of 585,656 sheets of paper.

Legal Division

A complete legal consultative service to the Department is provided by the legal officers of this division. The division represents the Department in litigation and advises on the legal implications of policies, acts and regulations. Advice was given during the year on the drafting of agreements and other documents, legislation and regulations, and legal counsel provided to the Councils of the Yukon Territory and the Northwest Territories. Officers of the division also advised the Canadian delegation to international conferences with respect to legal matters within the jurisdiction of the Department.

Personnel Division

The Personnel Division is responsible for planning and executing the departmental personnel policy and provides an advisory service on personnel administration. Records designed to produce a variety of information affecting staff are maintained. Specialized services are provided in establishment and classification, staff training and employee welfare. During the year, a formal procedure for the submission and consideration of employee grievances was established.

Members of the Personnel Division take an active part in the selection of candidates for promotion, and during the year, 127 competitions were held in the Department.

The Division takes care of the staff needs of 5,050 employees, about half of whom are classified regular civil servants and teaching staff, with the remainder being in the category of prevailing rate employees. Of the total work force, about 825 are employed in northern Canada. During the 12 months ended January 31, 1961, there were almost 500 new appointments in the Department.

On April 1, 1961 a District Personnel Office was established at Fort Smith to implement departmental and personnel procedures and to formulate and recommend policy with respect to personnel procedures in the Mackenzie District.

Purchasing Division

The Purchasing Division is responsible for procurement of all supplies and equipment needed by the Department. It represents the Department in dealings with suppliers; examines and investigates equipment and supplies

and recommends what should be purchased; operates the central stationery stores; and assists in co-ordinating the transport and delivery of supplies to northern Canada.

During 1960-61, there were 15,632 requisitions received and 15,557 purchase orders issued. The Purchasing Division continued to serve the Department of Forestry during the fiscal year and this total includes the requisitions received from, and the purchase orders issued for, that Department. Operations of the Fort Smith sub-office of the Division during the fiscal year accounted for 3,287 purchase orders of the total. Business firms operating in the Northwest Territories received 36 per cent of the purchase orders issued by this office.

Among the special purchases made by the Division were the highway maintenance machinery required by the Department to implement its responsibility for maintaining the Mackenzie Highway, prefabricated buildings for northern use, furnishings and supplies for schools in the Northwest Territories, and acetylene-operated exploders which were tested by the Canadian Wildlife Service in the Meadow Lake area of Saskatchewan to scare off waterfowl feeding in the grain fields.

Special Programs

Roads to Resources

Administration Services was responsible for the staff-work involved in negotiations with the provinces on the Federal-Provincial Roads to Resources program. Road construction projects proposed by the provinces were reviewed at a number of meetings of the Interdepartmental Roads Appraisal Committee on which the Departments of Public Works, Mines and Technical Surveys, and other interested federal agencies are represented.

On October 18, 1960, an agreement was signed with Quebec which brought about the participation of all ten provinces in the program. The agreements envisage the construction of over 4,500 miles of development roads, at a total estimated cost of about \$166 million. The federal government will share equally in the cost of these roads, up to a maximum contribution of \$7½ million in each province.

Campgrounds and Picnic Areas

Administration Services was also concerned with two co-operative federal-provincial programs for the development of campgrounds and picnic areas. One of these, designed to provide facilities along the Trans-Canada Highway, involves a federal contribution of \$2 million divided between the provinces in proportion to the highway mileage in each. The objective is to provide for a picnic ground every fifty miles, and a campground every hundred miles along the route of the highway.

The other program, called the Winter Work Campgrounds-Picnic Areas Program, placed no limit on the total amount of the federal contribution or the sites of the developments. The assistance was designed to encourage added employment during the winter months and to help the provinces in meeting the rapidly growing demand for camping facilities. During the winter of 1960-61, eight provinces participated in this program, and federal payments to them totalled over \$1,600,000. About 5,300 man-months of employment were provided.

Northern Co-ordination and Research Centre

Under the Northern Affairs and National Resources Act of December 16, 1953, the Minister was given the responsibility for fostering knowledge of the Canadian North and of the means of dealing with conditions related to its further development. The fostering of such knowledge is done in part by scientific investigation. To assist in the carrying out of this responsibility, the Northern Co-ordination and Research Centre was established in 1954, reporting through the Secretary of the Advisory Committee on Northern Development.

The Northern Co-ordination and Research Centre has three main functions: collecting and disseminating technical and scientific information concerning the north, co-ordinating scientific research in the north, and sponsoring and conducting scientific research in northern Canada.

Information

Information concerning the north is provided primarily through the Northern Affairs Library which is part of the Northern Co-ordination and Research Centre. The Northern Affairs Library has the responsibility for the purchasing, collecting and storing of books, periodicals, reports and micro-filmed material dealing with northern Canada and other northern areas. It provides reference material to the Department and other agencies. The Library also maintains map collections of the north, catalogues and files photographs of northern subjects and circulates accession lists, periodicals, books and bibliographies.

At present there are in excess of 5,000 books and periodicals on the shelves of the Library. During the year there have been more than 2,000 books on loan and answers were provided for better than 600 inquiries.

Co-ordination

The Centre co-ordinates northern research by making available the Secretariat for departmental and interdepartmental scientific research committees.

One officer serves as secretary to the scientific research sub-committee of the Advisory Committee on Northern Development. This sub-committee is made up of senior representatives of all departments carrying out scientific programs in the north. Another officer is the secretary to the Departmental Northern Research Committee, which is made up of all branch directors interested in northern research.

It also co-ordinates northern research by issuing licences and permits to scientists, explorers and archaeologists wishing to carry out research in the north. During the year 64 scientists and explorers licences were issued by the centre and six permits to archaeologists and ethnologists.

The Northern Co-ordination and Research Centre carries out scientific research on northern subjects of two main types:

The general type of research in which the Centre sponsors and conducts the program of investigation in northern Canada, other northern areas and in fields only marginally studied by other agencies. These studies have included biology, history, linguistics, physics, library administration and climate.

The main program of research is directed towards social anthropology and related subjects. These are investigations into the effects of social and economic change on the living conditions of the northern native peoples and the resulting administrative implications. This program is carried out by seasonally employed research scientists, by scientists under contract to the Department and by those awarded grants-in-aid of northern research.

Such scientists are available to provide professional advice and to study problems of immediate concern to the administrator.

Projects

Five social anthropology studies were undertaken in 1960. Of these four were new studies and one, at Lac la Martre, was the completion of a study begun in 1959. The new projects included an examination of the Eskimo settlements at Baker Lake which emphasized current caribou hunting practices. The Eskimo, Metis and Indian communities at Snowdrift and also along the Mackenzie River were all subjects of further anthropological surveys. An examination of the Eskimo community at Lake Harbour completed the program of studies in social anthropology for the year.

During the same period, the Centre was responsible for sponsoring several other scientific projects.

A demographic survey of native settlements in the Mackenzie Valley was completed. This study determined the bearing of many geographic features on the location of these settlements in relation to the provision of services and utilities.

Eskimo administration in Canada, Alaska and Greenland was undertaken in order to evaluate the administrative methods in the three areas. This is a comparative study over a two-year period and the results will have value to the administration in Ottawa.

The three main ethnic groups at Great Whale River in the Province of Quebec were the subject of a sociological examination. The Eskimo, Indian and white residents in the community were studied in the hope of understanding more clearly the social relations, or the lack of them, among these three neighbouring groups of people.

Secretariat, Advisory Committee on Water Use Policy

The purpose of the Advisory Committee on Water Use Policy, as established in 1955, is to advise the Minister of Northern Affairs and National Resources on federal policy on water uses. The Committee consists of the deputy ministers, or their representatives, of the following departments: Agriculture, Finance, Fisheries, Mines and Technical Surveys, National Health and Welfare, Northern Affairs and National Resources, and Trade and Commerce, together with the Under-Secretary of State for External Affairs and the Secretary to the Cabinet. In addition, representatives from other federal agencies may be invited to attend from time to time.

A Secretariat was established in 1956 to assist the Committee, and is responsible for liaison with various federal agencies and for the preparation of background papers on matters to be considered by the Committee. The Secretary also serves as secretary to the Canada-British Columbia Policy Liaison Committee, concerned with the development of the Columbia River.

The Secretariat was engaged in the planning and the preparation of background papers for the water sector of the national "Resources for Tomorrow" Conference.

Resources for Tomorrow Secretariat

The Secretariat was occupied during the fiscal year with preparations for the Resources for Tomorrow Conference to be held at Montreal, October 23-28, 1961.

Eighty background papers by specialists in the resource fields were prepared and processed for printing so that they could be made available two or three months before the Conference.

With the approval of the National Steering Committee, a program of public information on the Conference and its subject matter was started. A Public Information Core Group was established to develop public interest in the Conference. Each of the Provinces also formed a committee to develop and co-ordinate information.

APPENDICES

Appendix A

SUMMARY OF REVENUES AND EXPENDITURES 1960-61

	<i>Revenues</i>	<i>Expenditures</i>
ADMINISTRATION SERVICES	\$ 113.83	\$ 991,021.42
Contributions to the Provinces for Camp-ground and Picnic Area Developments ..		2,182,436.16
Acquisition of Canol Pipeline System		486,587.21
NORTHERN CO-ORDINATION AND RESEARCH CENTRE		101,842.32
NATIONAL PARKS BRANCH		
Branch Administration		235,902.96
National Parks and Historic Sites	2,009,499.21	22,672,313.17
Grant to Jack Miner Migratory Bird Foundation		5,000.00
Grant in aid of the development of the International Peace Garden in Manitoba		15,000.00
National Aviation Museum		122,772.21
National Battlefields Commission		178,099.00
Canadian Wildlife Service	4,751.29	707,613.58
	2,014,250.50	23,936,700.92
WATER RESOURCES BRANCH	325,380.17	2,011,745.30
NORTHERN ADMINISTRATION BRANCH		
Branch Administration	225,325.06	1,306,903.62
Education ..	9,318.58	6,937,239.08
Welfare and Industrial	127,551.19	1,816,800.73
Yukon Territory	312,764.53	5,032,884.20
Northwest Territories	2,726,140.88	14,048,165.22
Roads to Resources		12,000,000.00
	3,401,100.24	41,141,992.85
NATIONAL MUSEUM OF CANADA	1,560.98	760,335.35
CANADIAN GOVERNMENT TRAVEL BUREAU	2,814.82	2,682,515.54
GENERAL		725.00
TOTALS FOR DEPARTMENT	5,745,220.54	74,295,902.07

Appendix B

1. Mineral Production

NORTHWEST TERRITORIES				
	1959		1960	
	Quantity	Value	Quantity	Value
		\$		\$
Gold.....	405,922 ozs.	13,626,802	411,492 ozs.	13,961,924
Silver.....	70,560 ozs.	61,937	73,041 ozs.	64,904
Copper.....	986,682 lbs.	292,157	1,250,000 lbs.	378,625
Nickel.....	3,841,770 lbs.	2,689,239	4,700,000 lbs.	3,200,000
Pitchblende.....	919,333 lbs.	8,155,729	655,180 lbs.	5,077,645
TOTAL.....	—	24,825,864	—	22,683,098

YUKON TERRITORY				
	1959		1960	
	Quantity	Value	Quantity	Value
		\$		\$
Gold.....	66,960 ozs.	2,247,847	77,770 ozs.	2,638,736
Silver.....	7,054,632 ozs.	6,192,556	6,765,450 ozs.	6,011,779
Lead.....	21,592,456 lbs.	2,290,960	17,546,060 lbs.	1,873,919
Zinc.....	13,246,532 lbs.	1,621,375	10,323,961 lbs.	1,377,216
Cadmium.....	141,750 lbs.	181,440	143,513 lbs.	203,788
Coal.....	3,879 tons	58,200	4,945 tons	74,414
TOTAL.....	—	12,592,378	—	12,179,852

2. Timber Permits Issued and Volume of Timber Cut 1960-1961

No. of Permits issued	Yukon Territory		Northwest Territories (includes Wood Buffalo National Park)	
Commercial Permits.....	42		3	
Other Permits:				
Free of fees and dues.....	7		2	
Free of dues.....	10		—	
Dues paid.....	227		118	
TOTAL PERMITS ISSUED.....	286		123	

YUKON TERRITORY				NORTHWEST TERRITORIES (INCLUDES WOOD BUFFALO NATIONAL PARK)				
Volume of Timber Cut								
Lumber (ft.b.m.)	Round Timber (lin. ft.)	Fuel- wood (cords)	Ties	Lumber (ft.b.m.)	Round Timber (lin. ft.)	Fuel- wood (cords)	Ties	
Commercial Per- mits.....	6,971,189	944,568	1,460	9,675	19,503,547	2,400	591	—
Other Permits								
Free of fees and dues.....	—	7,635	937	—	—	28,366	120	100
Free of dues.....	—	256	410	—	—	—	495	—
Dues paid.....	48,000	231,430	4,382	—	—	582,298	1,269	—
TOTAL.....	7,019,189	1,183,889	7,189	9,675	19,503,547	613,064	2,475	100

3. Land Sales and Leases

LAND SALES	Yukon	Northwest Territories
Completed during year.....	118	32
New agreements of sale executed during year.....	22 (a)	11 (c)
Total number of agreements of sale in force.....	140 (b)	70 (d)

NOTE:

- (a) includes 8 agreements for veterans
- (b) includes 104 agreements for veterans
- (c) includes no agreements for veterans
- (d) includes 27 agreements for veterans

LAND LEASES

New leases executed during year.....	158	85
Assignments registered during year.....	33	3
Leases in force		
Agricultural.....	10	20
Commercial.....	117	182
Fur Farm.....	1	3
Grazing.....	11	2
Quarrying.....	3	6
Recreational.....	1	2
Religious.....	10	19
Residential.....	239	86
Licences of Occupation.....	3	3
Permissions to Occupy.....	1	1
TOTAL.....	396	324

4. Progress in School Enrolment

(Includes only children of school age 6—16th Birthday)

	1950-51			1960-61		
	School Age	In School	Per cent In School	School Age	In School	Per cent In School
Eskimo.....	2,464	194	8	3,062	1,622	53
Indian.....	1,027	368	36	1,315	1,015	77
*Other.....	1,627	621	38	1,964	1,793	91
	5,118	1,183	23	6,341	4,430	70

*Includes Metis

5. Enrolment in Vocational Training Classes

	Eskimo	Indian	Other	Total
Sir John Franklin.....	43	49	26	118
Special group courses.....	97	19	45	161
On-the-job.....	7	10	6	23
Schools outside N.W.T.....	8	13	33	54
	155	91	110	356

6. School Enrolment September 30, 1960

Mackenzie Education District

(Includes those over school-age (16) attending school as well as vocational trainees)

School	No. Rooms	Teaching Staff	Eskimo	Indian	Other	Total
Aklavik.....	7	8	53	25	64	142
Arctic Red River.....	1	1	—	13	—	13
Cambridge Bay.....	2	2	34	—	1	35
Coppermine.....	2	2	36	—	—	36
Fort Franklin.....	2	2	—	52	—	52
Fort Good Hope.....	2	1	—	11	7	18
Fort Liard.....	1	1	—	20	6	26
Fort McPherson.....	6	7	—	97	29	126
Fort Norman.....	2	2	—	17	30	47
Fort Providence.....	2	2	—	40	9	49
Fort Resolution.....	5	5	—	28	102	130
Fort Simpson (incl. 1 Hospital Room).....	12	16	—	151	78	229
Fort Smith (incl. 1 Hospital Room)	23	27	—	193	409	602
Fort Wrigley.....	1	1	—	22	—	22
Hay River.....	11	14	—	35	259	294
*Inuvik (incl. 1 Hospital Room)....	29	35	319	140	194	653
Jean Marie River.....	1	1	—	18	—	18
Lac la Martre.....	1	1	—	34	—	34
Nahanni Butte ¹	1	1	—	11	1	12
Norman Wells.....	1	1	—	3	17	20
Old Crow.....	2	2	—	46	11	57
Reindeer Station.....	1	1	14	—	—	14
Rae.....	3	3	—	48	9	57
Sir John Franklin.....	5	14	40	32	108	180
Snowdrift.....	1	1	—	32	—	32
Spence Bay.....	1	1	22	—	—	22
Tuktoyaktuk.....	4	4	78	2	4	84
**Discovery Yellowknife.....	1	1	—	—	12	12
Yellowknife P.S.....	18	25	—	—	364	364
Yellowknife S.S.....	10	10	—	27	171	198
	158	192	596	1,097	1,885	3,578

*The two hospital rooms operating at the beginning of the school year at Aklavik have been replaced by one at Inuvik.

¹This school opened after January 1, 1961.

**Company School.

7. School Enrolment September 30, 1960

Arctic Education District

(Includes those over school-age (16) attending school as well as vocational trainees)

School	No. Rooms	Teaching Staff	Eskimo	Indian	Other	Total
Arctic Bay ¹	1	1	30	—	—	30
Baker Lake.....	3	3	71	—	3	74
Belcher Islands.....	1	1	15	—	—	15
Broughton Island.....	1	1	15	—	—	15
*Cape Dorset.....	2	2	64	—	—	64
Chesterfield Inlet.....	4	4	102	—	4	106
Clyde River.....	1	1	12	—	—	12
Coral Harbour.....	2	2	52	—	3	55
Eskimo Point.....	2	2	26	—	—	26
Fort Chimo.....	3	4	80	—	7	87
Frobisher Bay.....	11	14	172	—	60	232
Great Whale River.....	6	6	84	30	3	117
Igloolik.....	2	2	26	—	—	26
Ivugivik.....	1	1	26	—	—	26
R.R.C.....	1	1	31	—	—	31
Koartak.....	1	1	13	—	—	13
Pangnirtung.....	1	1	22	—	—	22
Payne Bay.....	1	1	31	—	—	31
Pond Inlet ¹	1	1	19	—	—	19
Port Harrison.....	2	2	26	—	3	29
Povungnituk.....	3	3	104	—	—	104
Rankin Inlet.....	4	4	95	—	4	99
Resolute Bay.....	1	1	26	—	—	26
Sugluk.....	2	2	56	—	—	56
Wakeham Bay.....	1	1	38	—	—	38
Whale Cove ¹	1	1	23	—	7	30
	59	63	1,259	30	94	1,383
GRAND TOTALS (56).....	217	255	1,855	1,127	1,979	4,961

*Library room serves as a second classroom.

NOTE: Totals for staff and rooms include those for public, separate and company schools, but do not include community teacher positions in head offices at Fort Smith and Ottawa.

¹These schools opened after January 1st, 1961.

Appendix C

1. Location, Area and Comparative Statement of Visitors to the National Parks, April 1, 1960 to March 31, 1961

	Province	Area	1960-61	1959-60	Increase or Decrease
NATIONAL PARKS					
Banff.....	Alta.	2,564 sq. mi.	1,078,008	980,069	+ 97,939
Cape Breton Highlands.....	N.S.	367 "	323,392	193,684	+129,708
Elk Island.....	Alta.	75 "	198,277	196,862	+ 1,415
Fundy.....	N.B.	79.5 "	227,262	199,777	+ 27,485
Georgian Bay Islands.....	Ont.	5.4 "	19,657	17,630	+ 2,027
Glacier.....	B.C.	521 "	287	347	- 60
Jasper.....	Alta.	4,200 "	356,538	324,857	+ 31,681
Kootenay.....	B.C.	543 "	467,555	440,031	+ 27,524
Mount Revelstoke.....	B.C.	100 "	38,634	16,089	+ 22,545
Point Pelee.....	Ont.	6 "	545,545	745,528	-199,983
Prince Albert.....	Sask.	1,496 "	137,801	136,818	+ 983
Prince Edward Island.....	P.E.I.	7 "	412,463	224,781	+187,682
Riding Mountain.....	Man.	1,148 "	629,140	659,995	- 30,855
St. Lawrence Islands.....	Ont.	.27 (172 acres)	61,522	53,745	+ 7,777
Waterton Lakes.....	Alta.	203 sq. mi.	349,496	340,220	+ 9,276
Yoho.....	B.C.	507 "	65,071	70,001	- 4,930
Terra Nova.....	Nfld.	156 "	20,000	—	+ 20,000
SUB-TOTAL.....		11,978.17 "	4,930,648	4,600,434	+330,214

	Province	Area	1960-61	1959-60	Increase or Decrease
NATIONAL HISTORIC PARKS AND MAJOR HISTORIC SITES					
*Alexander Graham Bell Museum.....	N.S.	14 acres	59,784	47,122	+ 12,662
*Batoche Rectory.....	Sask.	1.25 "	5,896	936	+ 4,960
*Cartier-Brébeuf.....	P.Q.	5 "	—	10,365	- 10,365
*Fort Amherst.....	P.E.I.	222 "	893	—	+ 893
Fort Anne.....	N.S.	31 "	57,140	31,159	+ 25,981
Fort Battleford.....	Sask.	37 "	28,992	15,499	+ 13,493
Fort Beauséjour.....	N.B.	81 "	31,719	21,369	+ 10,350
Fort Chambly.....	P.Q.	2.5 "	68,738	67,438	+ 1,300
*Fort Langley.....	B.C.	9 "	91,627	45,870	+ 45,757
Fort Lennox.....	P.Q.	210 "	30,725	9,865	+ 20,860
Fortress of Louisbourg.....	N.S.	399.5 "	23,915	21,625	+ 2,290
Fort Malden.....	Ont.	8 "	41,558	32,132	+ 9,426
Fort Wellington.....	Ont.	8.5 "	35,449	28,732	+ 6,717
*Grand Pré.....	N.S.	14 "	34,361	38,981	- 4,620
Halifax Citadel.....	N.S.	37 "	204,677	190,383	+ 14,294
Lower Fort Garry.....	Man.	13 "	42,787	33,229	+ 9,558
Port Royal Habitation.....	N.S.	20.5 "	19,842	28,071	- 8,229
Port Prince of Wales.....	Man.	50 "	1,251	647	+ 604
Signal Hill.....	Nfld.	243.37 "	112,054	7,130	+104,924
*Sir Wilfrid Laurier's Birthplace.....	P.Q.	1.5 "	7,634	5,993	+ 1,641
Woodside.....	Ont.	11 "	5,170	4,972	+ 198
SUB-TOTAL.....		1,419.12 "	904,212	641,518	+262,694
GRAND TOTAL.....			5,834,860	5,241,952	+592,908
National Aviation Museum (Ottawa)			36,350	—	+ 36,350

* Major Historic Sites.

— No Record.

N.B.—No attendance records available for Wood Buffalo National Park, Alberta—N.W.T. (17,300 sq.mi.).

2. Mileage of Park Roads and Trails

National Park	Motor Roads	Secondary Roads	Fire Roads	Trails
Banff.....	216.50	—	158.25	705.75
Cape Breton Highlands.....	57.06	10.42	63.94	21.87
Elk Island.....	18.00	4.00	7.50	46.00
Fundy.....	19.90	—	35.60	1.90
Georgian Bay Islands.....	—	—	10.75	18.40
*Glacier.....	27.30	—	—	126.50
Jasper.....	104.00	66.00	104.00	620.55
Kootenay.....	59.40	—	56.80	209.00
*Mount Revelstoke.....	26.20	—	—	50.00
Point Pelee.....	11.50	2.00	2.00	1.50
Prince Albert.....	65.70	67.75	—	283.75
Prince Edward Island.....	20.00	7.00	—	2.00
Riding Mountain.....	75.50	13.56	95.00	17.00
*Terra Nova.....	32.53	1.40	3.50	6.65
Waterton Lakes.....	42.70	—	18.50	105.00
Yoho.....	41.10	—	45.00	246.00
TOTAL.....	817.39	172.13	600.84	2,461.87

* Some sections still under construction.

3. Forest Fire Losses in the National Parks

Park	Number of Fires		Area Burned (Acre)		Suppression Cost	
	55-59 av.	1960	55-59 av.	1960	55-59 av.	1960
Banff.....	5.2	10	2.0	.5	335.09	261.00
Jasper.....	7.2	5	3.4	4,800.0	560.81	21,155.88
Glacier.....	2.6	1	13.5	47.0	2,597.10	831.00
Kootenay.....	1.6	3	24.7	.1	1,580.73	155.17
Yoho.....	5.4	5	178.0	2,402.0	3,827.27	60,861.59
Mount Revelstoke.....	1.0	1	1.8	1,280.0	384.27	9,045.02
Waterton Lakes.....	.6	0	—	—	17.36	—
Elk Island.....	.4	0	.8	—	3.50	—
Prince Albert.....	1.2	1	18.3	—	335.26	9.30
Riding Mountain.....	4.6	7	528.8	595.2	838.54	4,545.90
Georgian Bay.....	.2	—	—	—	—	—
St. Lawrence Islands.....	1.2	—	.8	—	18.86	—
Point Pelee.....	.2	—	.1	—	3.00	—
Fundy.....	.4	—	—	—	2.00	—
Prince Edward Island.....	1.0	—	.4	—	1.20	—
Cape Breton Highlands.....	.6	1	1.6	—	144.71	—
Terra Nova.....	.2	2	.1	1.0	9.00	157.50
TOTAL.....	33.6	36	774.3	9,125.8	10,658.70	97,022.36

Causes		Size Classes	
Campfires.....	5	A —Less than $\frac{1}{4}$ acre.....	22
Smokers.....	7	B — $\frac{1}{4}$ -10 acres.....	5
Settlers.....	1	C1—10-100 acres.....	2
Railways.....	4	C2—100-500 acres.....	4
Lightning.....	10	D —Over 500 acres.....	3
Industrial Operations.....	1		—
Incendiary.....	2	TOTAL.....	36
Public Works.....	2		
Misc. Known.....	4		
Unknown.....	0		
TOTAL.....	36		

4. Major Construction in Parks

National Park	By National Parks	By Private Enterprise
BANFF.....	Residence and equipment building at the Healy Creek warden station. Equipment building at Bow Summit. Ski Patrol Hut at Mount Whitehorn. Two-car garage at Superintendent's residence. New service station in Government compound. Three service buildings and staff quarters at Tunnel Mountain campground. New ranch house, located outside of the park, at the Yaha Tinda Ranch.	89 building permits issued for a total construction value of \$1,042,951. A permit was issued valued at \$314,500 for a 50-unit motel development. Permits were issued for: two apartment buildings; addition of a convention hall and five rooms at Timberline Hotel; sixteen units at Archway Motel; central building and service station at Saskatchewan Bungalow Camp; new central building at Johnston Canyon Bungalows; two business blocks; addition of a class-room and thirteen rooms at Banff School of Fine Arts; eight new private residences; new residence and store at Lake Minnewanka concession.
CAPE BRETON HIGHLANDS	Addition to the administration building. Comfort station and laundry building at Ingonish Beach campground. Garage and fire equipment building at Big Intervale warden station. Chlorinator buildings at Cape Breton Highlands Bungalows and Cheticamp campground.	
ELK ISLAND	New administration building completed and occupied on November 25, 1960. A new compound area is under development. A new sewer system including a lift station and lagoon disposal and water filtration plant at the Headquarters area.	
FUNDY.....	New serviced campground having capacity of 235 tents at Point Wolfe is under construction. Twenty-nine lot trailer park complete with water, sewer, and electricity connections.	Building for metal work at the New Brunswick School of Arts and Crafts. Department of Agriculture—a new storage cellar and workshop at Herring Cove.
GEORGIAN BAY ISLANDS.	Equipment and boat storage shed. Two kitchen shelters.	Addition to main auditorium—Midland Y.M.C.A.; Arts and Crafts building and addition to main building—London Y.M.C.A.; Campers double cabin—Calvary Baptist Church camp.
JASPER.....	Staff quarters at Miette Hot Springs. Ablution building at Whistler Mountain ski hill site. Headquarters cabin on Blue Creek warden district. Light plant building at Snaring and Whirlpool warden headquarters.	70 building permits issued for total construction value of \$569,954. The gymnasium arena in the Jasper townsite had a building permit issued for \$270,694. Six residences and one service station were completed. Still under construction; Whistler Mountain Ski Chalet; nineteen private residences; hotel; apartment block; parish hall; nine cabins at the Jasper Park Lodge.
KOOTENAY.....	Warden patrol cabins in Floe Lake and Verdant Creek districts.	Staff building at Vermilion Crossing Bungalow Camp.
MOUNT REVELSTOKE.....	Four staff residences; one kitchen shelter at Heather Lake.	

4. Major Construction in Parks (Continued)

National Park	By National Parks	By Private Enterprise
POINT PELEE.....	New administration building completed and occupied in February 1961. New entrance gateway under construction.	
PRINCE ALBERT.....	New sanitary sewer system and winter water supply in Waskesiu townsite. New bunkhouse facilities. Hay shed 16 feet by 80 feet at Meridian Warden headquarters.	Motel completed; two summer dwellings; Manager's residence and two toilet and laundry buildings at Waskesiu Bungalow Cabins.
PRINCE EDWARD ISLAND	Extension to administration building; warden residence; pro shop at Green Gables golf course; extensive improvement to campsites include the addition of a sewer system, electricity, three toilet buildings and three kitchen shelters.	
RIDING MOUNTAIN.....	Duplex staff residence; warden residence at Ranch Creek; addition to warden station residence at Vermilion River; central service garage; four portable fire lookout cabins; kitchen shelters.	48 building permits were issued for a total construction value of \$106,235. The new R.C.M.P. detachment and residence valued at \$44,164. Permits issued for a service station addition; two cottages and five cabins.
ST. LAWRENCE ISLANDS..	Boat dock; six wells; boathouse and 150 feet of new sea wall at Mallo-rytown Landing.	
TERRA NOVA.....	Administration building; central garage; generator building; boat gear building; oil and grease storage building; lookout building at Ochre Hills.	
WATERTON LAKES.....	The swimming pool was completed and opened to the public June 10, 1960. Residence for townsite warden. Two comfort stations at Emerald Bay.	Alberta Motor Association office and living quarters; duplex and one private residence; two cabin units at Franklin Motel.
YOHO.....	New garage, stores and workshop buildings in Government compound. Residence and entrance gate building at the western entrance. Residence for Chief Warden.	

5. Statement of Large Mammals in Fenced Enclosures in National Parks

	Buffalo	Elk	Moose	Mule Deer	Total
Banff Park Paddock.....	4	—	—	—	4
Elk Island Park Paddock.....	650	172	139	178	1,139
Prince Albert Park Paddock.....	10	—	—	—	10
Riding Mountain Park Paddock.....	25	—	—	—	25
Waterton Lakes Park Paddock.....	18	—	—	—	18
	707	172	139	178	1,196

6. Reduction of Mammals

National Park	Mammal	Number Killed	Disposal of Meat and Hides
BANFF.....	Elk	193	Meat and hides sent to the Indian Affairs Branch.
	Buffalo	1	Hide sold to Mr. N. K. Luxton, meat used at departmental work camp.
ELK ISLAND.....	Buffalo	38	{ 50,137 lbs. of meat and 103 hides sent to the Indian Affairs Branch. 21,615 lbs. of meat and 45 hides sent to the Northern Administration Branch. One buffalo carcass donated to the United Nations at New York on behalf of the Department of External Affairs. One elk carcass donated to the Northern Alberta Pioneers and Old Timers Association. Pelts were sold for \$395.87.
	Elk	106	
	Moose	35	
	Deer	7	
	Beaver	51	
PRINCE ALBERT.....	Elk	22	Meat and hides sent to the Indian Affairs Branch.
	Buffalo	5	Meat used at departmental work camp.
RIDING MOUNTAIN.....	Elk	24	22 carcasses and 18 hides sent to the Indian Affairs Branch. Two carcasses used at departmental work camp.
	Buffalo	11	11 carcasses sent to Indian Affairs Branch 11 hides retained for departmental use.

7. Tablets Unveiled in 1960

<i>Title</i>	<i>Location</i>
Jonathan Sewell (French and English)	Quebec City, P.Q., 87 St. Louis St.
Maillou House (French and English)	Quebec City, P.Q. 17 St. Louis St.
Laurier House (French and English)	Ottawa, Ont. Laurier Ave. East and Chapel Streets.
New England Planters (English)	Horton Landing, N.S.
Emily Ferguson Murphy (English)	Edmonton, Alberta, Emily Ferguson Murphy Park.

8. Members of the Historic Sites and Monuments Board of Canada

- Dr. C. B. Fergusson, Halifax, N.S. (Chairman).
 Rt. Rev. Mgr. A. d'Eschambault, Genthon, Man. (Chairman) Deceased
 May 18, 1960.
 Dr. Walter N. Sage, Vancouver, B.C. Appointment expired May 19, 1960.
 Dr. W. Kaye Lamb, Dominion Archivist, Ottawa, Ont.
 Dr. A. G. Bailey, University of New Brunswick, Fredericton, N.B. Resigned
 October 7, 1960.
 Richmond Mayson, Esq., Regina, Sask.
 Edouard Fiset, Esq., Quebec, P.Q. Appointment expired October 26, 1960.
 Jules Bazin, Esq., Montreal, P.Q.
 O. L. Vardy, Esq., St. John's, Nfld.
 Dr. D. G. Creighton, University of Toronto, Toronto, Ont.
 Dr. A. R. M. Lower, Queen's University, Kingston, Ont.
 R. Earl Taylor, Esq., Charlottetown, P.E.I.
 Richard Y. Secord, Esq., Winterburn, Alta.
 Miss Margaret A. Ormsby, University of British Columbia, Vancouver, B.C. Appointed
 May 19, 1960.
 W. D. Smith, Esq., Brandon College, Brandon, Man. Appointed May 19, 1960.
 Clifford P. Wilson, Esq., Assistant Director, National Museum of Canada, Ottawa, Ont.
 Major Charles Gwyllm Dunn, Quebec, Que. Appointed November 3, 1960.
 John P. Palmer, Esq., Saint John, N.B. Appointed March 23, 1961.
 J. D. Herbert, Esq., Chief, National Historic Sites Division, Ottawa, Ont. (Secretary).

9. Banding of Wild Birds

Species	Number
Banded in 1960	
Ducks (including Coots).....	35,919
Geese.....	15,305
Trumpeter Swan.....	1
Colony nesting water birds.....	29,754
Other migratory birds.....	43,441
Total.....	124,420
Banded to date.....	1,575,152
Banded birds recovered to date.....	187,471*

*(This total includes birds banded in Canada and recovered in Canada or elsewhere, as well as birds banded outside Canada and recovered in this country.)

10. Licences and Permits Issued Under the Migratory Birds Convention Act

Nature of Permit or Licence	Number Issued
To collect birds for scientific purposes.....	439
To take migratory birds for propagation.....	9
To possess migratory birds for propagation.....	701
For bird-banding.....	216
For taxidermy.....	84
Total.....	1,449

Appendix D

NATIONAL MUSEUM

Natural History Branch and Human History Branch

Wednesday Evening Adult English Lectures

- "The New Russia"—Larry Henderson, Toronto.
"Down Among the Fishes"—John F. Storr, Ph.D., University of Buffalo.
"Discovering the Ancient History of the Yukon"—R. S. MacNeish, Ph.D., National Museum of Canada.
"Nature Nearby"—James A. Fowler, Cranbrook Institute of Science.
"Peaks, Passes and Packs"—J. O. Wheeler, Ph.D., Geological Survey of Canada.
"Austria—Gayest Holiday of All"—Neil Douglas, Meriden, Connecticut.
"The Origin of the Canadian Eskimos"—Lawrence Oschinsky, Ph.D. National Museum of Canada.
"The Challenge of Asia"—Larry Henderson, Toronto.
"The Belcher Islands Eskimo"—Milton Freeman, B.Sc., McGill University.
"17th and 18th Century Music"—The Ottawa Baroque Ensemble, commentary by George A. Proctor, Ph.D., National Museum of Canada.
"Adventure in Yucatan"—E. L. Bousfield, Ph.D., National Museum of Canada.
"Pakistan Today"—The Honourable Samuel Martin Burke, High Commissioner for Pakistan.
"Northland Flowers"—W. K. W. Baldwin, M.A., National Museum of Canada.
"Ontario Digs"—James V. Wright, M.A., National Museum of Canada.
"Manitoba Medley"—W. W. H. Gunn, Ph.D., Federation of Ontario Naturalists.
"Ukrainian Concert"—The Ukrainian Folk Ensemble of Montreal, Peter Marunczak, Director, with Miss Lubo Zuk, pianist.
"The Tinkers of Scotland"—F. G. Vallee, Ph.D., McMaster University.
"Perfumes"—C. G. Boyer, Vinant Limited, Montreal.

Special Adult English Lectures

- "The Evolution of Jazz in New Orleans"—Ottawa Traditional Jazz Society.
"Dixieland Jazz Moves Up River"—Ottawa Traditional Jazz Society.
"A Tribute to the Jazz Pioneers"—Ottawa Traditional Jazz Society.
"Chogolisa" ("The Bride's Peak"), and "Agriculture in Japan"—film program, provided by the Japanese Embassy.

Adult French Lectures

- "L'étang", "Klee Wyck", "Il était une chaise", "Chasseurs de caribou", "Pêcheurs de Terre-Neuve"—film program.
"Les charpentiers de la forêt", "Capitale de l'or", "Sports et Transports", "Angoti"—film program.
"Populations indigènes des Andes"—J. A. Vellard, Ph.D., Institut Français d'études Andines, Lima, Peru.
"Parfum"—C. G. Boyer, Vinant Limited, Montreal.

Saturday Morning Children's Programs

- "Kingdom on the Waters"—Hungarian nature film.
"White Wilderness"—Walt Disney nature film.
"Northwest Passage"—feature film involving Abenaki Indians.
Pottery making demonstration by A. M. Kinsey, National Museum of Canada; films "Peter and the Potter", "Animals of Alaska".
"The New Boat", "Letter from Indonesia"—film program.
"Seal Island", "Behind the Scenes of Walt Disney Studio"—film program.
"Angotee", "Above the Timberline"—film program.
"Louisiana Story"—Robert Flaherty documentary film.

Talk, with rapid sketches of marine life, and film "Underwater with a Camera"

—John F. Storr, Ph.D., University of Buffalo.

"Folk Song Fantasy", "Children's Concert", "Arctic Dog Team"—film program.

"Northwest Passage"—repeat showing.

"Sequoia"—natural history feature film.

Japanese program: Paper folding, dances, film—presented with the co-operation of the Citizenship Committee on Children and the Japanese Embassy.

"Nanook of the North"—Robert Flaherty—documentary film.

Talk on care of pets—K. G. Switzer, Director, Ottawa Humane Society.

"The African Lion"—Walt Disney nature film.

"Newfoundland Scene", "Wonders in a Country Stream", "Wonders in the Desert"—film program.

"Ti-Jean in the Land of Iron", "The Chairmaker and the Boys", "Birds of the Prairies"—film program.

"Canoes and Canoeing"—Larry Allen, Ottawa; also films "Portage" and "The Beaver".

"Legend of the Raven", "Energetically Yours"—film program.

"The Silent World"—Cousteau underwater feature film.

Appendix E

LIST OF TECHNICAL PUBLICATIONS ISSUED 1960-61

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- Experimental Use of Acetylene Exploders to Control Duck Damage, W. J. D. Stephen, North American Wildlife and Natural Resources Conference, Washington, D.C., March 1961.
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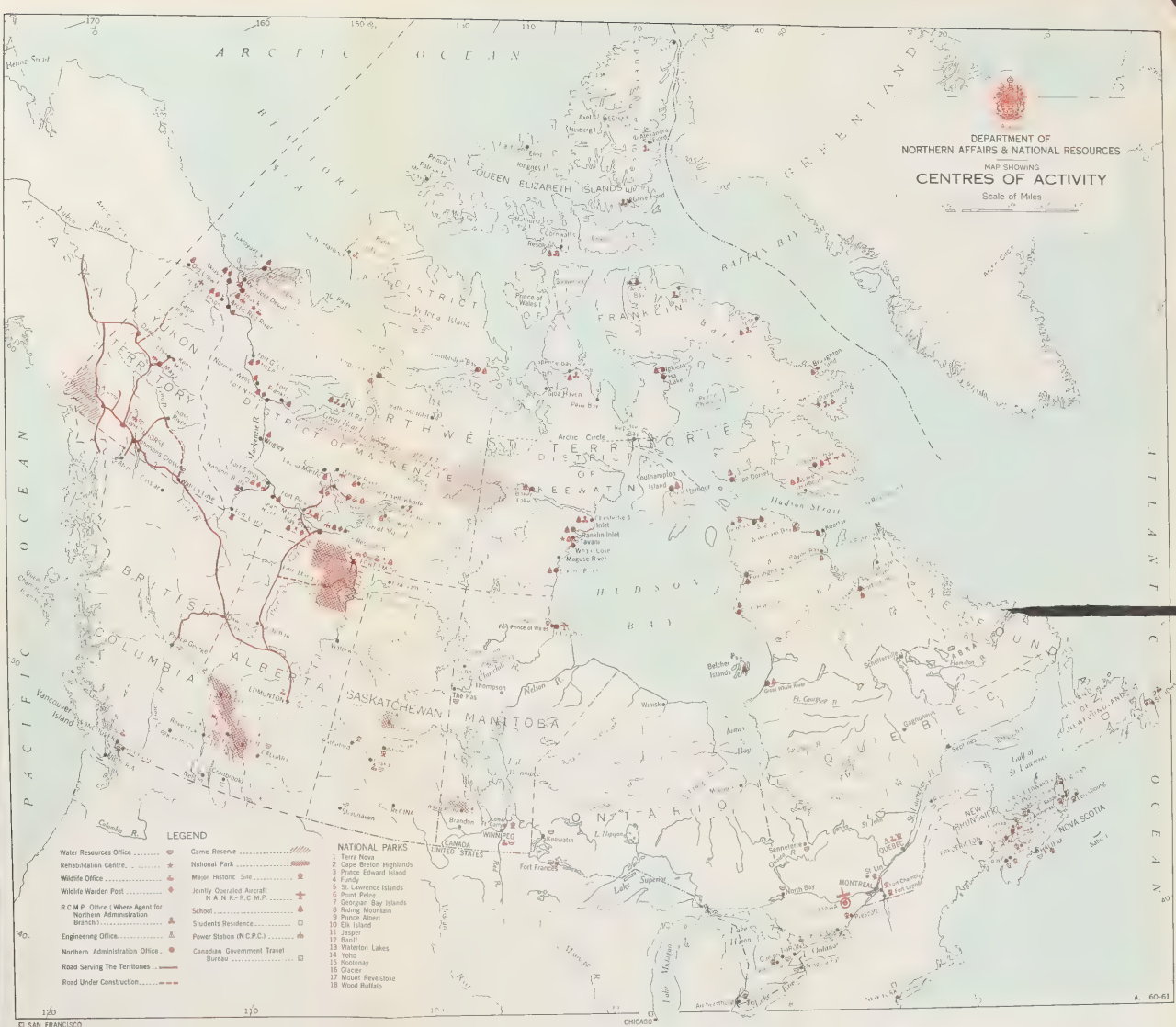
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DEPARTMENT OF
NORTHERN AFFAIRS & NATIONAL RESOURCES

MAP SHOWING
CENTRES OF ACTIVITY

Scale of Miles
0 100 200

LEGEND

- Water Resources Office
- Rehabilitation Centre
- Wildlife Office
- Wildlife Warden Post
- RCMP P. Office (Where Agent for Northern Administration Branch)
- Engineering Office
- Northern Administration Office
- Road Serving The Territories
- Road Under Construction
- Game Reserve
- National Park
- Major Historic Site
- Jointly Operated Aircraft N.A.R. & R.C.M.P.
- School
- Students Residence
- Power Station (N.C.P.C.)
- Canadian Government Travel Bureau

NATIONAL PARKS

- 1 Terry Hoof
- 2 Cape Breton Highlands
- 3 Prince Edward Island
- 4 Fundy
- 5 St. Lawrence Islands
- 6 Point Pelee
- 7 Georgian Bay Islands
- 8 Riding Mountain
- 9 Watkins Island
- 10 Elk Island
- 11 Jasper
- 12 Banff
- 13 Waterton Lakes
- 14 Yoho
- 15 Kootenay
- 16 Glacier
- 17 Mount Revelstoke
- 18 Wood Buffalo

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